

Taxon: <i>Protea compacta</i> R. Br.	Family: Proteaceae
Common Name(s): Bot River protea Bot River sugarbush	Synonym(s): <i>Protea triandra</i> Schltr.

Assessor: Chuck Chimera	Status: Assessor Approved	End Date: 17 Apr 2017
WRA Score: -4.0	Designation: L	Rating: Low Risk

Keywords: Lanky Shrub, Unarmed, Dense Stands, 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	?
301	Naturalized beyond native range		
302	Garden/amenity/disturbance weed		
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		
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	y=1, n=0	n

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	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	y=1, n=-1	y
604	Self-compatible or apomictic	y=1, n=-1	n
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	2
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	y=1, n=-1	n
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)	y=1, n=-1	y
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire		
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

Supporting Data:

Qsn #	Question	Answer
101	Is the species highly domesticated?	n
	Source(s)	Notes
	Manning, J. 2007. Field Guide to Fynbos. Struik Publishers, Cape Town, South Africa	[No evidence of domestication] "Lanky shrub to 3.5 m with oblong to oval leaves 50-130 mm long, curved upwards and lobed at the base, hairless when mature, bears narrowly cup-shaped flowerheads 90-120 x 70-100 mm with downy pink or white involucre bracts, the inner ones spoon-shaped; the style is 60-70 mm long. Coastal slopes and flats in the extreme southwestern Cape."

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

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2017. Personal Communication	NA

201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	Intermediate
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 17 Apr 2017]	"Native: Africa Southern Africa: South Africa - Cape Province" [In contrast to the rest of the South Africa, most of the Western Cape experiences a maritime Mediterranean climate*, with the winter months wet and cool, the summer hot and dry.]

202	Quality of climate match data	High
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 17 Apr 2017]	

Qsn #	Question	Answer
203	Broad climate suitability (environmental versatility)	n
	Source(s)	Notes
	Oliver, R. 2007. <i>Protea compacta</i> . PlantZAfrica. SANBI. https://www.plantzafrica.com/plantnop/proteacompacta.htm . [Accessed 17 Apr 2017]	"The Bot River protea is found on a relatively narrow zone along the southwestern Cape coast and extends from Kleinmond, Houw Hoek, Hermanus, Elim, Napier, Bredasdorp to Struisbaai. Populations mostly occur on the foothills of mountains close to the sea, coastal forelands and sandy flats close to the sea. It seldom grows at high altitudes with virtually all plants found between sea level and 100 m."

204	Native or naturalized in regions with tropical or subtropical climates	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 17 Apr 2017]	"Native: Africa Southern Africa: South Africa - Cape Province"
	Oliver, R. 2007. <i>Protea compacta</i> . PlantZAfrica. SANBI. https://www.plantzafrica.com/plantnop/proteacompacta.htm . [Accessed 17 Apr 2017]	"The Bot River protea is found on a relatively narrow zone along the southwestern Cape coast and extends from Kleinmond, Houw Hoek, Hermanus, Elim, Napier, Bredasdorp to Struisbaai. Populations mostly occur on the foothills of mountains close to the sea, coastal forelands and sandy flats close to the sea. It seldom grows at high altitudes with virtually all plants found between sea level and 100 m."

205	Does the species have a history of repeated introductions outside its natural range?	?
	Source(s)	Notes
	Oliver, R. 2007. <i>Protea compacta</i> . PlantZAfrica. SANBI. https://www.plantzafrica.com/plantnop/proteacompacta.htm . [Accessed 17 Apr 2017]	" <i>Protea compacta</i> plays a significant role in the South African cut flower industry. With a flowering period spanning autumn to summer, it is popular with florists and at roadside stalls. For this reason this well known protea is cultivated on an extensive scale."
	Dave's Garden. 2017. Bot River Protea - <i>Protea compacta</i> . http://davesgarden.com/guides/pf/go/151805/ . [Accessed 17 Apr 2017]	"This plant has been said to grow in the following regions: San Leandro, California Vista, California"

301	Naturalized beyond native range	
	Source(s)	Notes
	Moodley, D. (2013). Determinants of introduction and invasion success for Proteaceae. MSc Thesis. Stellenbosch University, Stellenbosch, South Africa	No evidence in this study
	Wagner, W.L., Herbst, D.R. & Lorence, D.H. 2017. Flora of the Hawaiian Islands. Smithsonian Institution, Washington, D.C. http://botany.si.edu/ . [Accessed 17 Apr 2017]	No evidence to date
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	Reported as naturalized and as a weed, but investigation of sources cited are inconclusive

Qsn #	Question	Answer
302	Garden/amenity/disturbance weed	
	Source(s)	Notes
	Spear, D., McGeoch, M.A., Foxcroft, L.C. & Bezuidenhout, H., 2011. Alien species in South Africa's national parks. Koedoe 53(1), Art. #1032, 4 pages. doi:10.4102/koedoe.v53i1.1032	"Checklist of alien species in South Africa's 19 national parks" [Protea compacta listed as present in TM: Table Mountain. No description of impacts, if any, provided]
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	Cited as a weed. Confirmation needed [reference cited, Spear et al. (2011) was inconclusive]

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

304	Environmental weed	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. (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	A number of other Protea species are listed as naturalized and/or weeds, but unable to corroborate with references cited.

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Oliver, R. 2007. Protea compacta. PlantZAfrica. SANBI. https://www.plantzafrica.com/plantnop/proteacompacta.htm . [Accessed 17 Apr 2017]	"Protea compacta is a single-stemmed, lanky and sparsely branched shrub which grows up to 2.0-3.5 m tall. The leaves curve upwards and are ovate to lanceolate to heart-shaped at the base. They are normally 50-130 x 20-55 mm. The stemless leaves clasp the branches and overlap upwards. The young leaves are soft and hairy as opposed to hairless and leathery when mature. "

402	Allelopathic	n
	Source(s)	Notes

Qsn #	Question	Answer
	Oliver, R. 2007. <i>Protea compacta</i> . PlantZAfrica. SANBI. https://www.plantzafrica.com/plantnop/proteacompacta.htm . [Accessed 17 Apr 2017]	[No evidence] "If one is to take a more organic approach to gardening and to try to emulate growing conditions in its natural habitat, it would be beneficial if one considers growing it with other plants that grow with it in the wild. Advantages may include a more simple garden maintenance plan and possible symbioses that will create stronger plants. Some plants that grow with this species and which make attractive garden subjects are <i>Protea repens</i> , <i>P. lepidocarpodendron</i> , <i>P. coronata</i> , <i>Erica ericoides</i> , <i>E. viscaria</i> subsp. <i>longifolia</i> , <i>E. pinea</i> , <i>Restio dispar</i> , <i>Gnidia squarrosa</i> , <i>Berzelia lanuginosa</i> , <i>Aulax umbellata</i> , <i>Passerina corymbosa</i> , <i>Leucadendron tinctum</i> , <i>L. xanthoconus</i> , <i>L. salignum</i> , <i>Brunia albiflora</i> , <i>B. noduliflora</i> and <i>Phaenocoma prolifera</i> ."
	WRA Specialist. 2017. Personal Communication	Unknown. No evidence found

403	Parasitic	n
	Source(s)	Notes
	Manning, J. 2007. Field Guide to Fynbos. Struik Publishers, Cape Town, South Africa	"Lanky shrub to 3.5 m with oblong to oval leaves 50-130 mm long, curved upwards and lobed at the base, hairless when mature, bears narrowly cup-shaped flowerheads 90-120 x 70-100 mm with downy pink or white involucral bracts, the inner ones spoon-shaped; the style is 60-70 mm long. Coastal slopes and flats in the extreme southwestern Cape." [Proteaceae. No evidence]

404	Unpalatable to grazing animals	n
	Source(s)	Notes
	Heydenrych, B. J. (1999). An investigation of land-use practices on the Agulhas Plain (South Africa), with emphasis on socio-economic and conservation issues. MSc Thesis. University of Cape Town	[Flower buds browsed] "Game farming is not always compatible with flower farming since the relatively palatable developing buds of desirable Proteaceae may be selectively and intensively browsed (e.g. <i>Protea compacta</i> buds browsed by eland as communicated by P. Cilliers, Waterford Farm)."

405	Toxic to animals	n
	Source(s)	Notes
	Heydenrych, B. J. (1999). An investigation of land-use practices on the Agulhas Plain (South Africa), with emphasis on socio-economic and conservation issues. MSc Thesis. University of Cape Town	[No evidence] "Game farming is not always compatible with flower farming since the relatively palatable developing buds of desirable Proteaceae may be selectively and intensively browsed (e.g. <i>Protea compacta</i> buds browsed by eland as communicated by P. Cilliers, Waterford Farm)."
	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	n
	Source(s)	Notes

Qsn #	Question	Answer
	<p>Benic, L. and Knox-Davies, P. S. (1983). Anthracnose of <i>Protea compacta</i> caused by <i>Colletotrichum gloeosporioides</i>. <i>Phytophylactica</i>, 15, 109-119</p>	<p>"<i>Colletotrichum gloeosporioides</i> was regularly isolated from stem lesions of a die-back disease of <i>Protea compacta</i>. It was frequently accompanied by a <i>Botryosphaeria</i>. Both fungi were inoculated into stems of mature <i>P. compacta</i> plants. Only <i>C. gloeosporioides</i> caused typical die-back symptoms, but lesions were more extensive when both fungi were present: Both fungi were isolated from seed receptacles and seed, but only <i>C. gloeosporioides</i> was recovered from damped-off and blighted seedlings in the glasshouse. Seedlings inoculated with <i>C. gloeosporioides</i> developed typical damping-off and blight. A warm (30°C) thiram soak and thiram dusting applied to seed after 30 min hot water (50°C) treatment gave good control of seedling diseases. Seed treatment also enhanced seed germination. Captab was phytotoxic to developing seedlings."</p>
	<p>Knox-Davies, P. S., Van Wyk, P. S., & Marasas, W. F. O. (1985). Diseases of proteas and their control in the South-Western Cape. <i>ISHS Acta Horticulturae</i> 185: 189-200</p>	<p>"Most local protea diseases are caused by fungi belonging to the Loculoascomycotina and Deuteromycotina. There are no records of any rusts, smuts, powdery mildews, downy mildews, or bacterial or viral diseases. Many leaf specks, leaf blotches and leaf spots reduce the value of cut flowers. Important leaf spot diseases are those caused by <i>Mycosphaerella proteae</i> on <i>Protea neriifolia</i> and <i>Protea grandiceps</i>, by <i>Leptosphaeria protearum</i> on <i>Protea magnifica</i> and by <i>Batcheloromyces proteae</i> on certain <i>Protea cynaroides</i> ecotypes. Canker, die-back, anthracnose and blighting of shoots and twigs are especially common in older plantations. <i>Colletotrichum gloeosporioides</i> is important on <i>Protea compacta</i> and other species, whereas a <i>Drechslera</i> sp. causes blighting of certain <i>Leucospermum cordifolium</i> cultivars. The role of <i>Botryosphaeria</i> spp. is not clear, though they seem to be extremely successful opportunistic colonizers of protea shoots, flower parts and seeds. Scab is caused by an <i>Elsinoe</i> sp. Corky lesions develop on stems and leaves, particularly of <i>L. cordifolium</i>, and flowering is reduced. Control of above-ground fungal diseases is largely by applying sanitation measures, by avoiding susceptible species and cultivars, and by strategic use of fungicides. Witches' broom is an important disease of <i>P. cynaroides</i>, <i>P. neriifolia</i> and <i>P. compacta</i> X <i>P. neriifolia</i> hybrids. Control is by controlling the mite <i>Aceria proteae</i> and by strict sanitation. Damping-off and seedling blight occur sporadically. Some common pathogens are involved, but only <i>C. gloeosporioides</i> has been studied to any extent. It is controlled by thiram seed treatment. <i>Phytophthora cinnamomi</i> root rot is particularly severe on <i>Leucadendron argenteum</i>, <i>Leucospermum cordifolium</i>, <i>Leucadendron discolor</i> and <i>Leucadendron tinctorum</i>. Losses are reduced by avoiding soils with a history of root rot and by planting tolerant species or cultivars. Cuttings sometimes die in mistbeds. A preplant treatment with captafol has given promising control. Postharvest diseases include rhizopus and botrytis decay of <i>L. cordifolium</i> blooms and blackening of <i>Protea</i> leaves. Use of disease-resistant cultivars is an important general disease control measure. But erosion of disease resistance in breeding programs means that shifts in importance of the different pathogens could occur. There is also the danger that indigenous pathogens will be disseminated on breeding material distributed to growers."</p>

407	Causes allergies or is otherwise toxic to humans	n
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Qsn #	Question	Answer
	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
	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	
	Source(s)	Notes
	Oliver, R. 2007. <i>Protea compacta</i> . PlantZAfrica. SANBI. https://www.plantzafrica.com/plantnop/proteacompacta.htm . [Accessed 17 Apr 2017]	[Possibly. Forms dense stands in a fire-prone ecosystem. Could contribute to fire risk] "The Bot River sugarbush is serotinous which allows the plant to store seeds on the plant for years. When the bush gets killed during a fire, the seeds normally survive and ensure the successful reproduction of the species. The serotiny phenomenon is an adaptation by certain genera within Proteaceae of the Cape Floral Kingdom to deal with the need to store nutrient-rich seeds safely in the nutrient-poor soils of this fire-prone vegetation."

409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	Notes
	Oliver, R. 2007. <i>Protea compacta</i> . PlantZAfrica. SANBI. https://www.plantzafrica.com/plantnop/proteacompacta.htm . [Accessed 17 Apr 2017]	" <i>Protea compacta</i> thrives in coastal and low altitude mountain gardens. It grows in acidic, well drained, sandy soil in full sun."
	Dave's Garden. 2017. Bot River Protea - <i>Protea compacta</i> . http://davesgarden.com/guides/pf/go/151805/ . [Accessed 17 Apr 2017]	"Sun Exposure: Full Sun"

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	n
	Source(s)	Notes
	Oliver, R. 2007. <i>Protea compacta</i> . PlantZAfrica. SANBI. https://www.plantzafrica.com/plantnop/proteacompacta.htm . [Accessed 17 Apr 2017]	"It grows in acidic, well-drained, sandy soil in full sun."
	Australian Native Plant Nursery. 2017. <i>Protea compacta</i> . http://www.australianplants.com/plants.aspx?id=1411 . [Accessed 17 Apr 2017]	"Prefers full sun, well-drained soils, tolerates some alkalinity, light frost and extended dry periods once established."
	Dave's Garden. 2017. Bot River Protea - <i>Protea compacta</i> . http://davesgarden.com/guides/pf/go/151805/ . [Accessed 17 Apr 2017]	"Soil pH requirements: 5.6 to 6.0 (acidic) 6.1 to 6.5 (mildly acidic)"

411	Climbing or smothering growth habit	n
	Source(s)	Notes

Qsn #	Question	Answer
	Manning, J. 2007. Field Guide to Fynbos. Struik Publishers, Cape Town, South Africa	"Lanky shrub to 3.5 m with oblong to oval leaves 50-130 mm long, curved upwards and lobed at the base, hairless when mature, bears narrowly cup-shaped flowerheads 90-120 x 70-100 mm with downy pink or white involucral bracts, the inner ones spoon-shaped; the style is 60-70 mm long"
412	Forms dense thickets	y
	Source(s)	Notes
	Oliver, R. 2007. <i>Protea compacta</i> . PlantZAfrica. SANBI. https://www.plantzafrica.com/plantnop/proteacompacta.htm . [Accessed 17 Apr 2017]	"This species is highly social and grows in dense stands of thousands of plants."
501	Aquatic	n
	Source(s)	Notes
	Manning, J. 2007. Field Guide to Fynbos. Struik Publishers, Cape Town, South Africa	"Coastal slopes and flats in the extreme southwestern Cape."
502	Grass	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 14 Apr 2017]	Proteaceae
503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 14 Apr 2017]	Proteaceae
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Oliver, R. 2007. <i>Protea compacta</i> . PlantZAfrica. SANBI. https://www.plantzafrica.com/plantnop/proteacompacta.htm . [Accessed 17 Apr 2017]	" <i>Protea compacta</i> is a single-stemmed, lanky and sparsely branched shrub which grows up to 2.0-3.5 m tall."
601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes

Qsn #	Question	Answer
	Flower Valley Conservation Trust. 2017. <i>Protea compacta</i> . http://www.flowervalley.co.za/en/specie/protea-compacta-2/ . [Accessed]	[Rarity due to habitat loss & hybridization, but not to substantial reproductive failure] "In some instances, dense fields of <i>Protea compacta</i> have been broadcast-sown over newly ploughed fynbos veld. This practice is illegal because it destroys the natural diversity of fynbos. It is also listed as Near Threatened on the Red List due to habitat loss, invasive alien plants and hybridisation."

602	Produces viable seed	y
	Source(s)	Notes
	Oliver, R. 2007. <i>Protea compacta</i> . PlantZAfrica. SANBI. https://www.plantzafrica.com/plantnop/proteacompacta.htm . [Accessed 17 Apr 2017]	" <i>Protea compacta</i> plays a significant role in the South African cut flower industry. With a flowering period spanning autumn to summer, it is popular with florists and at roadside stalls. For this reason this well known protea is cultivated on an extensive scale. This is done by broadcasting the seed over newly ploughed land to form dense stands." ... "This shrub is a rapid and vigorous grower that may even flower in its second year. Flowers should normally be expected only from the fifth year if grown from seed." ... "Sow seeds in well-drained soil during autumn, then cover them with a fine layer of sand and keep moist. Germination occurs readily within 30-40 days. It is advisable to treat the seeds with a fungicide during storage or prior to sowing as it improves germination and subsequently the number of seedlings."

603	Hybridizes naturally	y
	Source(s)	Notes
	Flower Valley Conservation Trust. 2017. <i>Protea compacta</i> . http://www.flowervalley.co.za/en/specie/protea-compacta-2/ . [Accessed 17 Apr 2017]	"It is also listed as Near Threatened on the Red List due to habitat loss, invasive alien plants and hybridisation." [Suggests that unintentional hybridization is occurring]
	Leonhardt, K.W. and R. A. Criley. 1999. Proteaceae floral crops: Cultivar development and underexploited uses. p. 410–430. In: J. Janick (ed.), Perspectives on New Crops and New Uses. ASHS Press, Alexandria, VA	"Table 4. Recent <i>Protea</i> hybrids of South African origin." [<i>P. compacta</i> × <i>P. susannae</i> ; <i>P. cynaroides</i> × <i>P. compacta</i>]
	Oliver, R. 2007. <i>Protea compacta</i> . PlantZAfrica. SANBI. https://www.plantzafrica.com/plantnop/proteacompacta.htm . [Accessed 17 Apr 2017]	"The ability of the natural species as a cut flower convinced researchers and farmers of its hybridizing potential, the result being <i>Protea compacta</i> as the parent plant to numerous cultivars such as Pink Ice (<i>P. compacta</i> × <i>P. susannae</i>), Pink Duke (<i>P. compacta</i> × <i>P. eximia</i>), Lady Di (<i>P. compacta</i> × <i>P. magnifica</i>), and Carnival (<i>P. compacta</i> × <i>P. neriifolia</i>)." "

604	Self-compatible or apomictic	n
	Source(s)	Notes
	Acton, Q. A. (Ed.). (2013). Issues in Life Sciences—Botany and Plant Biology Research: 2013 Edition. ScholarlyEditions, Atlanta, GA	" <i>Protea</i> have strong self-incompatibility systems. However, this assumption was based largely on studies conducted on a clade of bird-pollinated species that occur in the shrubby fynbos vegetation of the Cape region of southern Africa."

605	Requires specialist pollinators	y
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Qsn #	Question	Answer
	Source(s)	Notes
	Flower Valley Conservation Trust. 2017. <i>Protea compacta</i> . http://www.flowervalley.co.za/en/specie/protea-compacta-2/ . [Accessed 17 Apr 2017]	" <i>Protea compacta</i> is pollinated by Sugarbirds and Sunbirds. Seeds are retained in flower heads until after the next fire."
	Rourke, J., & Wiens, D. (1977). Convergent floral evolution in South African and Australian Proteaceae and its possible bearing on pollination by nonflying mammals. <i>Annals of the Missouri Botanical Garden</i> , 64(1): 1-17	" <i>Protea compacta</i> , a typical bird-pollinated species at anthesis"

606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	Oliver, R. 2007. <i>Protea compacta</i> . PlantZAfrica. SANBI. https://www.plantzafrica.com/plantnop/proteacompacta.htm . [Accessed 17 Apr 2017]	[No evidence] "Propagate the shrub vegetatively by taking 60-100 mm long semi-hardwood cuttings using the current season's growth. Remove the leaves of the basal third of the cutting, dip in a rooting hormone and place in a well-drained medium (coarse river sand or a 1:1 mixture of bark and polystyrene). Cuttings root best in a growing house with intermittent mist and bottom heat of 25C ."

607	Minimum generative time (years)	2
	Source(s)	Notes
	Oliver, R. 2007. <i>Protea compacta</i> . PlantZAfrica. SANBI. https://www.plantzafrica.com/plantnop/proteacompacta.htm . [Accessed 17 Apr 2017]	[2-5 years] "This shrub is a rapid and vigorous grower that may even flower in its second year. Flowers should normally be expected only from the fifth year if grown from seed. "

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Protea Atlas Project. 2017. Spoon-bract Sugarbushes - Proteas. http://www.proteaatlas.org.za/sugar9.htm . [Accessed 17 Apr 2017]	"Seed dispersal: Wind"
	Oliver, R. 2007. <i>Protea compacta</i> . PlantZAfrica. SANBI. https://www.plantzafrica.com/plantnop/proteacompacta.htm . [Accessed 17 Apr 2017]	"Serotinous fruit are flat, soft-shelled nutlets and often hairy or winged. After a ripening period of about seven months, fruits are retained in the seed heads on the plant. The seed heads only release the fruit when the water supply to them stops, i.e. the bush is killed. "

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Oliver, R. 2007. <i>Protea compacta</i> . PlantZAfrica. SANBI. https://www.plantzafrica.com/plantnop/proteacompacta.htm . [Accessed 17 Apr 2017]	" <i>Protea compacta</i> plays a significant role in the South African cut flower industry. With a flowering period spanning autumn to summer, it is popular with florists and at roadside stalls. For this reason this well known protea is cultivated on an extensive scale."
	Dave's Garden. 2017. Bot River Protea - <i>Protea compacta</i> . http://davesgarden.com/guides/pf/go/151805/ . [Accessed 17 Apr 2017]	"This plant has been said to grow in the following regions: San Leandro, California Vista, California"

Qsn #	Question	Answer
703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Esler, K., Cowling, R., Witkowski, E., & Mustart, P. (1989). Reproductive Traits and Accumulation of Nitrogen and Phosphorus During the Development of Fruits of <i>Protea compacta</i> R. Br. (Calcifuge) and <i>Protea obtusifolia</i> Buek. ex Meisn. (Calcicole). <i>The New Phytologist</i> , 112(1), 109-115	"The calcifuge <i>P. compacta</i> had larger seeds with higher N and P content but a lower annual seed production than the calcicole <i>P. obtusifolia</i> ." [Unlikely. Large seeds conspicuous and not likely to become inadvertently dispersed]
704	Propagules adapted to wind dispersal	y
	Source(s)	Notes
	Protea Atlas Project. 2017. Spoon-bract Sugarbushes - Proteas. http://www.proteaatlas.org.za/sugar9.htm . [Accessed 17 Apr 2017]	"Fruit: Stored on plant Seed dispersal: Wind Seed storage: In seedheads on plant"
705	Propagules water dispersed	n
	Source(s)	Notes
	Protea Atlas Project. 2017. Spoon-bract Sugarbushes - Proteas. http://www.proteaatlas.org.za/sugar9.htm . [Accessed 17 Apr 2017]	"Fruit: Stored on plant Seed dispersal: Wind Seed storage: In seedheads on plant"
706	Propagules bird dispersed	n
	Source(s)	Notes
	Protea Atlas Project. 2017. Spoon-bract Sugarbushes - Proteas. http://www.proteaatlas.org.za/sugar9.htm . [Accessed 17 Apr 2017]	"Fruit: Stored on plant Seed dispersal: Wind Seed storage: In seedheads on plant"
707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Protea Atlas Project. 2017. Spoon-bract Sugarbushes - Proteas. http://www.proteaatlas.org.za/sugar9.htm . [Accessed 17 Apr 2017]	"Fruit: Stored on plant Seed dispersal: Wind Seed storage: In seedheads on plant"
708	Propagules survive passage through the gut	n
	Source(s)	Notes
	Protea Atlas Project. 2017. Spoon-bract Sugarbushes - Proteas. http://www.proteaatlas.org.za/sugar9.htm . [Accessed 17 Apr 2017]	"Fruit: Stored on plant Seed dispersal: Wind Seed storage: In seedheads on plant"
801	Prolific seed production (>1000/m2)	n
	Source(s)	Notes

Qsn #	Question	Answer
	Esler, K., Cowling, R., Witkowski, E., & Mustart, P. (1989). Reproductive Traits and Accumulation of Nitrogen and Phosphorus During the Development of Fruits of <i>Protea compacta</i> R. Br. (Calcifuge) and <i>Protea obtusifolia</i> Buek. ex Meisn. (Calcicole). <i>The New Phytologist</i> , 112(1), 109-115	"The calcifuge <i>P. compacta</i> had larger seeds with higher N and P content but a lower annual seed production than the calcicole <i>P. obtusifolia</i> . It is proposed that <i>P. compacta</i> exhibits a trade-off between seed and crop size since it requires larger, more nutritious seeds to establish in the infertile soils" ... "Table 2. Stand characteristics and selected reproductive traits of <i>Protea compacta</i> and <i>Protea obtusifolia</i> populations on the Agulhas Plain" [No. 'plump' seeds/cone = 3.2; Seed set(%) = 4.4]

802	Evidence that a persistent propagule bank is formed (>1 yr)	y
	Source(s)	Notes
	Oliver, R. 2007. <i>Protea compacta</i> . PlantZAfrica. SANBI. https://www.plantzafrica.com/plantnop/proteacompacta.htm . [Accessed 17 Apr 2017]	["Canopy" seed bank] "The Bot River sugarbush is serotinous which allows the plant to store seeds on the plant for years. When the bush gets killed during a fire, the seeds normally survive and ensure the successful reproduction of the species."

803	Well controlled by herbicides	
	Source(s)	Notes
	WRA Specialist. 2017. Personal Communication	Unknown. No information on herbicide efficacy or chemical control of this species

804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	Notes
	Oliver, R. 2007. <i>Protea compacta</i> . PlantZAfrica. SANBI. https://www.plantzafrica.com/plantnop/proteacompacta.htm . [Accessed 17 Apr 2017]	[Killed by fire. Tolerates regular pruning] "The Bot River sugarbush is serotinous which allows the plant to store seeds on the plant for years. When the bush gets killed during a fire, the seeds normally survive and ensure the successful reproduction of the species. " ... "This species develops long slender branches that become top heavy and eventually the plant falls sideways. This can be overcome by pinching back the young plants and the regular cutting of the long-stemmed flowers. In the event of old, woody shrubs, the stems bearing the old flower heads should be cut back to create a better shape and encourage the development of new shoots and longer stems."

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

Summary of Risk Traits:

High Risk / Undesirable Traits

- Grows in maritime, Mediterranean climates
- Reported to be naturalized and/or a weed but evidence is inconclusive
- From fire-prone ecosystem. May increase fire risk in introduced range.
- Forms dense stands in native range
- Reproduces by seeds
- Hybridizes with other *Protea* species
- May reach reproductive maturity in as little as 2 years (more commonly mature at 5 years)
- Seeds dispersed by wind & intentionally by people
- Serotinous seeds form a persistent canopy “seed bank”
- Tolerates regular pruning

Low Risk Traits

- Unarmed (no spines, thorns, or burrs)
- Non-toxic
- Ornamental
- Self-incompatible
- Not reported to spread vegetatively
- Relatively large, serotinous seeds unlikely to be inadvertently dispersed