

Taxon: *Boophone disticha* (L. f.) Herb.

Family: Amaryllidaceae

Common Name(s): bushman poison bulb
candelabra flower
Cape poison
century plant
kaffir onion
poison bulb
sore-eye flower

Synonym(s): *Amaryllis disticha* L. f.

Assessor: Chuck Chimera

Status: Assessor Approved

End Date: 13 Sep 2016

WRA Score: -3.0

Designation: L

Rating: Low Risk

Keywords: Bulbous Herb, Toxic, Geophyte, Long-Lived, 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)	High
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	n
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	?
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	y=1, n=-1	n
405	Toxic to animals	y=1, n=0	y

Qsn #	Question	Answer Option	Answer
406	Host for recognized pests and pathogens	y=1, n=0	n
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	y
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	n
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	n
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	y
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	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/m2)		
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	n
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
	Lithudzha, E. 2005. <i>Boophone disticha</i> (L.f.) Herb. PlantZAfrica. SANBI. http://www.plantzafrica.com/plantab/boophdist.htm . [Accessed 9 Sep 2016]	[Used medicinally, but not domesticated] " <i>Boophone disticha</i> has many medicinal uses, for example the Bushman once used the poison for their arrows, and traditional healers use it to treat pain and wounds. Parts of the plant are used by certain African tribes and also by some Europeans to cure various ailments. The outer covering of the bulb is applied to boils and abscesses. Fresh leaves are used to stop bleeding of wounds. The plants are known to be poisonous to cattle and sheep. The name sore-eye flower refers to the fact that if a person is exposed to the open flowers in a confined space; it may lead to sore eyes and even to a headache."

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"	High
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 8 Sep 2016]	"Native: Africa East Tropical Africa: Kenya; Tanzania; Uganda South Tropical Africa: Angola; Malawi; Mozambique; Zambia; Zimbabwe Southern Africa: Botswana; Lesotho; Namibia; South Africa - Eastern Cape, - Free State, - Gauteng, - KwaZulu-Natal, - Limpopo, - Mpumalanga, - Western Cape; Swaziland West-Central Tropical Africa: Burundi; Rwanda; Zaire"

202	Quality of climate match data	High
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 8 Sep 2016]	

Qsn #	Question	Answer
203	Broad climate suitability (environmental versatility)	n
	Source(s)	Notes
	Lithudzha, E. 2005. <i>Boophone disticha</i> (L.f.) Herb. PlantZAfrica. SANBI. http://www.plantzafrica.com/plantab/boophdist.htm . [Accessed 9 Sep 2016]	" <i>Boophone disticha</i> is widely distributed in all provinces of South Africa and tropical Africa. The genus comprises of five or six species and is distributed throughout southern Africa to tropical Africa, but <i>B. disticha</i> is the most widespread and occurs mainly in summer rainfall region."
	Dave's Garden. 2016. Bushman Poison - <i>Boophone disticha</i> . http://davesgarden.com/guides/pf/go/61924/ . [Accessed 9 Sep 2016]	"Hardiness: USDA Zone 9a: to -6.6 °C (20 °F) USDA Zone 9b: to -3.8 °C (25 °F) USDA Zone 10a: to -1.1 °C (30 °F) USDA Zone 10b: to 1.7 °C (35 °F)"

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	Lithudzha, E. 2005. <i>Boophone disticha</i> (L.f.) Herb. PlantZAfrica. SANBI. http://www.plantzafrica.com/plantab/boophdist.htm . [Accessed 8 Sep 2016]	" <i>Boophone disticha</i> is widely distributed in all provinces of South Africa and tropical Africa. The genus comprises of five or six species and is distributed throughout southern Africa to tropical Africa, but <i>B. disticha</i> is the most widespread and occurs mainly in summer rainfall region."
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 8 Sep 2016]	"Native: Africa East Tropical Africa: Kenya; Tanzania; Uganda South Tropical Africa: Angola; Malawi; Mozambique; Zambia; Zimbabwe Southern Africa: Botswana; Lesotho; Namibia; South Africa - Eastern Cape, - Free State, - Gauteng, - KwaZulu-Natal, - Limpopo, - Mpumalanga, - Western Cape; Swaziland West-Central Tropical Africa: Burundi; Rwanda; Zaire"

205	Does the species have a history of repeated introductions outside its natural range?	?
	Source(s)	Notes
	Dave's Garden. 2016. Bushman Poison - <i>Boophone disticha</i> . http://davesgarden.com/guides/pf/go/61924/ . [Accessed 9 Sep 2016]	"This plant has been said to grow in the following regions: Bostonia, California Mission Viejo, California San Diego, California Simi Valley, California Thousand Oaks, California Vista, California Toronto, Ontario"
	San Marcos Growers. 2016. <i>Boophone disticha</i> - Oxbane. http://www.smgrowers.com/products/plants/plantdisplay.asp?plant_id=2915# . [Accessed 13 Sep 2016]	Cultivated as an ornamental

301	Naturalized beyond native range	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
	Wagner, W.L., Herbst, D.R.& Lorence, D.H. 2016. Flora of the Hawaiian Islands. Smithsonian Institution, Washington, D.C. http://botany.si.edu/ . [Accessed 12 Sep 2016]	No evidence to date

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

303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

304	Environmental weed	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

305	Congeneric weed	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

401	Produces spines, thorns or burrs	n
	Source(s)	Notes

Qsn #	Question	Answer
	Grobler, B. A. (2012). A Systematic Conservation Assessment and Plan for the Baakens River Valley, Port Elizabeth. MSc Thesis, Nelson Mandela Metropolitan University, Port Elizabeth, Eastern Cape, South Africa	[No evidence] "a deciduous, bulbous plant of the Amaryllidaceae (Plate 2). The tunicated bulb is partially exposed and up to 300 mm in diameter (Gledhill 1981). The inflorescence is a dense umbel and can be up to 220 mm high, or can be on such a short stem that they appear to grow directly from the bulb (Vanderplank 1999). Flowers are 25 – 35 mm long, varying in colour from white to pink to red with yellow anthers (Gledhill 1981; Goldblatt & Manning 2000; Vanderplank 1999). The flowers are also sweetly scented. The pedicels lengthen after flowering to form a large seedhead that is spherical in shape. The seedhead eventually breaks off the scape and tumbles across the ground, dispersing seed in this manner. Leaves are greyish-green in colour, erect with undulating edges, up to 300 mm long, and arranged in a conspicuous fan (Gledhill 1981; Goldblatt & Manning 2000; Vanderplank 1999). The leaves generally only appear in June after flowering has taken place (Goldblatt & Manning 2000)."

402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown

403	Parasitic	n
	Source(s)	Notes
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"Herb, deciduous, bulb above ground, stem white, peduncle green-white, succulent, perianth pinkish red, sweetly scented flowers dark pink, fruit yellow-red" [Amaryllidaceae (Liliaceae, Alliaceae). No evidence]

404	Unpalatable to grazing animals	n
	Source(s)	Notes
	Greenham, J. 2000. USAID Agribusiness Linkages Project: Eastern Cape Province South Africa Draft Final Report on Medicinal Plants. ARD, Inc., Burlington, Vermont	"Leaves apparently non-poisonous."
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[Apparently palatable, despite toxicity] "Boophone disticha ... Plants known to be poisonous to cattle and sheep."

405	Toxic to animals	y
	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	"Boophone disticha ... Plants known to be poisonous to cattle and sheep. Bulb very poisonous if eaten, irritant to the skin,"

406	Host for recognized pests and pathogens	n
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Qsn #	Question	Answer
	Source(s)	Notes
	LLIFLE. 2016. <i>Boophane disticha</i> . http://www.llifle.com/Encyclopedia/BULBS/Family/Amaryllidaceae/1351/Boophane_disticha . [Accessed 13 Sep 2016]	[General pests] "Pest and diseases: The bulbs and leaf bases are susceptible to attack by mealy bugs, and the leaf margins are chewed by snout beetles and slugs at night."

407	Causes allergies or is otherwise toxic to humans	y
	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	"Plants known to be poisonous to cattle and sheep. Bulb very poisonous if eaten, irritant to the skin, internal use dangerous; concoctions of the bulb taken orally cause sedation, analgesia, visual hallucinations, irrational behaviour, coma or death. Fresh leaves used to stop bleeding of wounds. Bulb scales used as wound dressing after circumcision and as general wound dressing, treating boils, septic wounds. Bulb infusion antibacterial and antiinflammatory, external application on sores, wounds, rheumatic pain. Used for the external treatment of various skin and inflammatory conditions. Arrow poison. Veterinary medicine, a remedy for redwater disease in cattle; bulb scales abortifacient. Ceremonial, rituals."

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Williamson, G. (2012). The remarkable <i>Boophone disticha</i> (Lf) Herb (Amaryllidaceae); survivor from the northern tropical savanna woodlands to the South African semi-arid Karoo. <i>Cactus and Succulent Journal</i> , 84(2), 88-91	"Apart from being partly drought resistant, they survive the frequent fires that occur in the tropical woodlands and open grasslands in Eastern and South Central Africa."
	Greenham, J. 2000. USAID Agribusiness Linkages Project: Eastern Cape Province South Africa Draft Final Report on Medicinal Plants. ARD, Inc., Burlington, Vermont	[Adapted to fire prone ecosystems, but apparently does not contribute to fire risk] "Flowers: Emerge at beginning of rains, distinctive stalk with ball of scarlet flowers. Fire induces flowering."

409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	Notes
	San Marcos Growers. 2016. <i>Boophone disticha</i> - Oxbane. http://www.smgrowers.com/products/plants/plantdisplay.asp?plant_id=2915# . [Accessed 13 Sep 2016]	"Exposure: Full Sun"
	Greenham, J. 2000. USAID Agribusiness Linkages Project: Eastern Cape Province South Africa Draft Final Report on Medicinal Plants. ARD, Inc., Burlington, Vermont	"Grow from seed, sown uncovered on free draining potting mix. Some shade at first." [Some shade, but habitat tends to be in high light environments]
	Lithudzha, E. 2005. <i>Boophone disticha</i> (L.f.) Herb. PlantZAfrica. SANBI. http://www.plantzafrica.com/plantab/boophdist.htm . [Accessed 13 Sep 2016]	"This plant thrives in full sun in well-drained, sandy soil and also in rocky areas."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	n
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Qsn #	Question	Answer
	Source(s)	Notes
	San Marcos Growers. 2016. Boophone disticha - Oxbane. http://www.smgrowers.com/products/plants/plantdisplay.asp?plant_id=2915# . [Accessed 13 Sep 2016]	"Plant in full sun in a well-drained soil and water little to regularly while in leaf."
	Dave's Garden. 2016. Bushman Poison - Boophone disticha. http://davesgarden.com/guides/pf/go/61924/ . [Accessed 13 Sep 2016]	"Soil pH requirements: 6.1 to 6.5 (mildly acidic) 6.6 to 7.5 (neutral) 7.6 to 7.8 (mildly alkaline)"
	South African National Biodiversity Institute. 2016. Boophone disticha. PlantZAfrica. http://pza.sanbi.org/boophone-disticha . [Accessed 13 Sep 2016]	"Soil type: Sandy"
	LLIFLE. 2016. Boophane disticha. http://www.llifle.com/Encyclopedia/BULBS/Family/Amaryllidaceae/1351/Boophane_disticha . [Accessed 13 Sep 2016]	"Soil: It needs a slightly acid medium comprising equal parts of well decomposed compost or finely milled bark, and river or silica sand (or pumice). Plant the bulbs with the neck at, or just below soil level and can remain in the same position for many years. Grows it in pots with a diameter of at least 25 cm. Give it excellent drainage."
	Lithudzha, E. 2005. Boophone disticha (L.f.) Herb. PlantZAfrica. SANBI. http://www.plantzafrica.com/plantab/boophdist.htm . [Accessed 13 Sep 2016]	"This plant thrives in full sun in well-drained, sandy soil and also in rocky areas. " ... "The plants seem to grow equally well in well-drained, sandy soil and in hard ground"

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Greenham, J. 2000. USAID Agribusiness Linkages Project: Eastern Cape Province South Africa Draft Final Report on Medicinal Plants. ARD, Inc., Burlington, Vermont	"A deciduous herb with a large bulb, which annually produces a fan of leaves and a dense umbel of dull red flowers when leafless. Up to 45 cm high. The fruiting inflorescence can break away and roll over the ground, dispersing the seeds. A thick covering of papery membranous scales sheath the bulb, which is ovoid 130 cm. thick."

412	Forms dense thickets	n
	Source(s)	Notes
	Grobler, B. A. (2012). A Systematic Conservation Assessment and Plan for the Baakens River Valley, Port Elizabeth. MSc Thesis, Nelson Mandela Metropolitan University, Port Elizabeth, Eastern Cape, South Africa	"It is most commonly found on rocky slopes and flats (Goldblatt & Manning 2000), dry or rocky grassland, and in sparse scrub (Plowes & Drummond 1976). In the Port Elizabeth area this species is most commonly found in coastal thickets, but is widely distributed throughout the entire region (Vanderplank 1999)." [Occurs in, but presumably does not form, coastal thickets]
	Greenham, J. 2000. USAID Agribusiness Linkages Project: Eastern Cape Province South Africa Draft Final Report on Medicinal Plants. ARD, Inc., Burlington, Vermont	"Occurrence: Found in woodland and along dambo margins and in dry grassland, often in rocky places. Up to 2450 m. Rocky grassland, bush-land and clear forests. Widespread." [No evidence]

Qsn #	Question	Answer
501	Aquatic	n
	Source(s)	Notes
	Lithudzha, E. 2005. <i>Boophone disticha</i> (L.f.) Herb. PlantZAfrica. SANBI. http://www.plantzafrica.com/plantab/boophdist.htm . [Accessed 13 Sep 2016]	[Terrestrial] "This plant thrives in full sun in well-drained, sandy soil and also in rocky areas."
502	Grass	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 13 Sep 2016]	Family: Amaryllidaceae Subfamily: Amaryllidoideae Tribe: Amaryllideae Subtribe: Boophoninae
503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 13 Sep 2016]	Family: Amaryllidaceae Subfamily: Amaryllidoideae Tribe: Amaryllideae Subtribe: Boophoninae
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y
	Source(s)	Notes
	Grobler, B. A. (2012). A Systematic Conservation Assessment and Plan for the Baakens River Valley, Port Elizabeth. MSc Thesis, Nelson Mandela Metropolitan University, Port Elizabeth, Eastern Cape, South Africa	"Table 5: The species of conservation concern recorded in the Baakens River Valley." [Boophone disticha - Growth form = Geophyte] "Boophone disticha ... is a deciduous, bulbous plant of the Amaryllidaceae (Plate 2). The tunicated bulb is partially exposed and up to 300 mm in diameter (Gledhill 1981)."
601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Greenham, J. 2000. USAID Agribusiness Linkages Project: Eastern Cape Province South Africa Draft Final Report on Medicinal Plants. ARD, Inc., Burlington, Vermont	"Widespread. South Africa, Namibia, Botswana, Lesotho, Mozambique, Angola, Zimbabwe, Zambia, Malawi, Tanzania, Kenya, Uganda, Burundi, South Congo."

Qsn #	Question	Answer
602	Produces viable seed	y
	Source(s)	Notes
	Greenham, J. 2000. USAID Agribusiness Linkages Project: Eastern Cape Province South Africa Draft Final Report on Medicinal Plants. ARD, Inc., Burlington, Vermont	"Fruits: Borne on stalklets about 20 cm long in July-October. Three cornered capsules, drop seeds as they roll along. Turbinate, irregularly dehiscent, 1.5-3 x 1-1.5 cm. Seeds 3.5 mm in diameter." ... "Grow from seed, sown uncovered on free draining potting mix."
	Dave's Garden. 2016. Bushman Poison - Boophone disticha. http://davesgarden.com/guides/pf/go/61924/ . [Accessed 13 Sep 2016]	"Propagation Methods: From seed; sow indoors before last frost"

Qsn #	Question	Answer
603	Hybridizes naturally	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown

Qsn #	Question	Answer
604	Self-compatible or apomictic	
	Source(s)	Notes
	Pacific Bulb Society. 2016. Boophone seed. http://www.pacificbulbsociety.org/pbslist/2016-June/ivoqvueeu1ubef493u9rhvu271.html# . [Accessed 13 Sep 2016]	"Boophone are slightly self-compatible in my experience. This year, for instance, I've gotten about ~10 seeds from the only Boophone disticha that bloomed for me. This bloom included one individual flower stem that branched into 3 stems where the flower would normally be with each of those stems having a flower at the end (and one of them set a single seed)."
	The Bulb Maven. 2016. South African bulbs. http://thebulbmaven.typepad.com/the_bulb_maven/south_african_bulbs/page/2/ . [Accessed 13 Sep 2016]	"Boophone disticha, seen to the left, is the most commonly grown, and one I have also been able to grow from seed to blooming size successfully." ... "They are not self-compatible, so you need two blooming plants to produce seeds."
	WRA Specialist. 2016. Personal Communication	Conflicting accounts of self-compatibility are reported by growers. Plants may possess limited self-compatibility

Qsn #	Question	Answer
605	Requires specialist pollinators	n
	Source(s)	Notes
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"Sudan, S. Africa. Herb, deciduous, bulb above ground, stem white, peduncle green-white, succulent, perianth pinkish red, sweetly scented flowers dark pink, fruit yellow-red, flower-heads attract bees and flies"
	Lithudzha, E. 2005. Boophone disticha (L.f.) Herb. PlantZAfrica. SANBI. http://www.plantzafrica.com/plantab/boophdist.htm . [Accessed 13 Sep 2016]	"The large, round, sweetly scented flowerheads attract bees and flies, which pollinate the flowers. The plants also receive visits from ants."

Qsn #	Question	Answer
606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	Greenham, J. 2000. USAID Agribusiness Linkages Project: Eastern Cape Province South Africa Draft Final Report on Medicinal Plants. ARD, Inc., Burlington, Vermont	[No evidence] "Cultivation: Needs a free-draining soil, and dry summers, resent disturbance and may take several years to attain flowering. Not frost tolerant. Division is difficult. Grow from seed, sown uncovered on free draining potting mix."

607	Minimum generative time (years)	>3
	Source(s)	Notes
	Williams, V.L., Raimondo, D., Brueton, V.J., Crouch, N.R., Cunningham, A.B., Scott-Shaw, C.R., Lötter, M. & Ngwenya, A.M. 2008. <i>Boophone disticha</i> (L.f.) Herb. National Assessment: Red List of South African Plants version 2015.1. http://redlist.sanbi.org/species.php?species=2076-2 . [Accessed 13 Sep 2016]	" the plant takes more than 10 years to get to a flowering stage and they don't flower every year."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Greenham, J. 2000. USAID Agribusiness Linkages Project: Eastern Cape Province South Africa Draft Final Report on Medicinal Plants. ARD, Inc., Burlington, Vermont	[Possible as seeds are relatively small, but unlikely. Lack means of external attachment] "The fruiting inflorescence can break away and roll over the ground, dispersing the seeds." ... "Fruits: Borne on stalklets about 20 cm long in July-October. Three cornered capsules, drop seeds as they roll along. Turbinate, irregularly dehiscent, 1.5-3 x 1-1.5 cm. Seeds 3.5 mm in diameter."

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Cultivated as an ornamental

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Williams, V.L., Raimondo, D., Brueton, V.J., Crouch, N.R., Cunningham, A.B., Scott-Shaw, C.R., Lötter, M. & Ngwenya, A.M. 2008. <i>Boophone disticha</i> (L.f.) Herb. National Assessment: Red List of South African Plants version 2015.1. http://redlist.sanbi.org/species.php?species=2076-2 . [Accessed 13 Sep 2016]	[No evidence. Unlikely given dispersal method, long time to flowering, & recalcitrant seeds] "The species is, however, long-lived, widely distributed and can recolonize new sites due to its tumbleweed-like inflorescence." ... "it is not certain if the bulbs can replace themselves quickly since the seeds are recalcitrant and need to germinate straight away at the beginning of the rainy season in a favourable spot. Furthermore, the plant takes more than 10 years to get to a flowering stage and they don't flower every year."

704	Propagules adapted to wind dispersal	y
	Source(s)	Notes

Qsn #	Question	Answer
	Williamson, G. (2012). The remarkable <i>Boophone disticha</i> (Lf) Herb (Amaryllidaceae); survivor from the northern tropical savanna woodlands to the South African semi-arid Karoo. <i>Cactus and Succulent Journal</i> , 84(2), 88-91	"The peduncle is very stout carrying a dense, rounded ball of very numerous (100 or more) brightly coloured red-pink to dark pink flowers with long pedicels which elongate even further, and stiffen during maturity, to carry the dried seed capsules. Seed distribution occurs after the 30 cm long peduncle detaches from the bulb, and the wind carries the dry, spherical-spoked seed ball hither and thither over the veld."
	Lithudzha, E. 2005. <i>Boophone disticha</i> (L.f.) Herb. PlantZAfrica. SANBI. http://www.plantzafrica.com/plantab/boophdist.htm . [Accessed 8 Sep 2016]	[Wind may aid dispersal, along with gravity] "The pedicels (flower stalks) elongate after flowering to form a large seedhead. This breaks off at the top of the scape (stalk) and tumbles across the veld dispersing the seed."

705	Propagules water dispersed	n
	Source(s)	Notes
	Grobler, B. A. (2012). A Systematic Conservation Assessment and Plan for the Baakens River Valley, Port Elizabeth. MSc Thesis, Nelson Mandela Metropolitan University, Port Elizabeth, Eastern Cape, South Africa	[Possible that some secondary dispersal by water may occur, but unlikely given habitat & dispersal mode] "The pedicels lengthen after flowering to form a large seedhead that is spherical in shape. The seedhead eventually breaks off the scape and tumbles across the ground, dispersing seed in this manner." ... "It is most commonly found on rocky slopes and flats (Goldblatt & Manning 2000), dry or rocky grassland, and in sparse scrub (Plowes & Drummond 1976)."

706	Propagules bird dispersed	n
	Source(s)	Notes
	Snijman, D., & Linder, H. (1996). Phylogenetic Relationships, Seed Characters, and Dispersal System Evolution in Amaryllidaceae (Amaryllidaceae). <i>Annals of the Missouri Botanical Garden</i> , 83(3), 362-386	" <i>Boophone disticha</i> and <i>Boophone haemanthoides</i> F. M. Leight. share indehiscent, beaked fruits, which are also found in <i>Crinum</i> , <i>Ammocharis</i> , and <i>Cybistetes</i> . However, the species are uniquely characterized by the abscission of the fruiting head from the top of the scape."
	Williamson, G. (2012). The remarkable <i>Boophone disticha</i> (Lf) Herb (Amaryllidaceae); survivor from the northern tropical savanna woodlands to the South African semi-arid Karoo. <i>Cactus and Succulent Journal</i> , 84(2), 88-91	"The peduncle is very stout carrying a dense, rounded ball of very numerous (100 or more) brightly coloured red-pink to dark pink flowers with long pedicels which elongate even further, and stiffen during maturity, to carry the dried seed capsules. Seed distribution occurs after the 30 cm long peduncle detaches from the bulb, and the wind carries the dry, spherical-spoked seed ball hither and thither over the veld."

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Greenham, J. 2000. USAID Agribusiness Linkages Project: Eastern Cape Province South Africa Draft Final Report on Medicinal Plants. ARD, Inc., Burlington, Vermont	"the whole seed head becomes a sphere, 40 cm up to 60 cm in diameter, which breaks off when dry and rolls along in the wind." ... "Fruits: Borne on stalklets about 20 cm long in July-October. Three cornered capsules, drop seeds as they roll along. Turbinate, irregularly dehiscent, 1.5-3 x 1-1.5 cm. Seeds 3.5 mm in diameter."

708	Propagules survive passage through the gut	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Greenham, J. 2000. USAID Agribusiness Linkages Project: Eastern Cape Province South Africa Draft Final Report on Medicinal Plants. ARD, Inc., Burlington, Vermont	[No means of external attachment] "Fruits: Borne on stalklets about 20 cm long in July-October. Three cornered capsules, drop seeds as they roll along. Turbinate, irregularly dehiscent, 1.5-3 x 1-1.5 cm. Seeds 3.5 mm in diameter."

801	Prolific seed production (>1000/m2)	
	Source(s)	Notes
	Greenham, J. 2000. USAID Agribusiness Linkages Project: Eastern Cape Province South Africa Draft Final Report on Medicinal Plants. ARD, Inc., Burlington, Vermont	[Seed density unknown] "Fruits: Borne on stalklets about 20 cm long in July-October. Three cornered capsules, drop seeds as they roll along. Turbinate, irregularly dehiscent, 1.5-3 x 1-1.5 cm. Seeds 3.5 mm in diameter."

802	Evidence that a persistent propagule bank is formed (>1 yr)	n
	Source(s)	Notes
	Williams, V.L., Raimondo, D., Brueton, V.J., Crouch, N.R., Cunningham, A.B., Scott-Shaw, C.R., Lötter, M. & Ngwenya, A.M. 2008. <i>Boophone disticha</i> (L.f.) Herb. National Assessment: Red List of South African Plants version 2015.1. http://redlist.sanbi.org/species.php?species=2076-2 . [Accessed 13 Sep 2016]	"it is not certain if the bulbs can replace themselves quickly since the seeds are recalcitrant and need to germinate straight away at the beginning of the rainy season in a favourable spot."
	Dave's Garden. 2016. Bushman Poison - <i>Boophone disticha</i> . http://davesgarden.com/guides/pf/go/61924/ . [Accessed 13 Sep 2016]	"Seed does not store well; sow as soon as possible"

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	y
	Source(s)	Notes
	Williamson, G. (2012). The remarkable <i>Boophone disticha</i> (Lf) Herb (Amaryllidaceae); survivor from the northern tropical savanna woodlands to the South African semi-arid Karoo. <i>Cactus and Succulent Journal</i> , 84(2), 88-91	"Apart from being partly drought resistant, they survive the frequent fires that occur in the tropical woodlands and open grasslands in Eastern and South Central Africa."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits

- Able to grow in regions with tropical climates
- Bulb very poisonous to animals & people
- Geophyte
- Reproduces by seeds & can resprout from bulbs
- May have limited self-compatibility
- Seeds dispersed by wind & intentionally by people
- Tolerates fire (resprouts from bulbs)

Low Risk Traits

- No reports of invasiveness or naturalization, but unclear how widespread it has been introduced outside native range
- Unarmed (no spines, thorns or burrs)
- Requires full sun
- Not reported to spread vegetatively
- Reaches maturity in 10+ years & does not flower every year
- Seeds recalcitrant & unlikely to form a persistent seed bank