

Australia/New Zealand Weed Risk Assessment adapted for United States.

Data used for analysis published in: Gordon, D.R. and C.A. Gantz. 2008. Potential impacts on the horticultural industry of screening new plants for invasiveness. Conservation Letters 1: 227-235. Available at: <http://www3.interscience.wiley.com/cgi-bin/fulltext/121448369/PDFSTART>

<i>Combretum ovalifolium</i>			
Question number	Question	Answer	Score
1.01	Is the species highly domesticated?	n	0
1.02	Has the species become naturalised where grown?		
1.03	Does the species have weedy races?		
2.01	Species suited to U.S. climates (USDA hardiness zones; 0-low, 1-intermediate, 2-high)	2	
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high)	2	
2.03	Broad climate suitability (environmental versatility)	?	
2.04	Native or naturalized in regions with an average of 11-60 inches of annual precipitation	y	1
2.05	Does the species have a history of repeated introductions outside its natural range?	?	
3.01	Naturalized beyond native range	n	-1
3.02	Garden/amenity/disturbance weed	n	0
3.03	Weed of agriculture	n	0
3.04	Environmental weed	n	0
3.05	Congeneric weed	y	2
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic		
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals		
4.05	Toxic to animals	n	0
4.06	Host for recognised pests and pathogens		
4.07	Causes allergies or is otherwise toxic to humans	n	0
4.08	Creates a fire hazard in natural ecosystems		
4.09	Is a shade tolerant plant at some stage of its life cycle		
4.1	Grows on one or more of the following soil types: alfisols, entisols, or mollisols	y	1
4.11	Climbing or smothering growth habit	y	1
4.12	Forms dense thickets		
5.01	Aquatic	n	0

5.02	Grass	n	0
5.03	Nitrogen fixing woody plant	n	0
5.04	Geophyte	n	0
6.01	Evidence of substantial reproductive failure in native habitat	n	0
6.02	Produces viable seed		
6.03	Hybridizes naturally		
6.04	Self-compatible or apomictic		
6.05	Requires specialist pollinators		
6.06	Reproduction by vegetative fragmentation		
6.07	Minimum generative time (years)		
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
7.02	Propagules dispersed intentionally by people	n	-1
7.03	Propagules likely to disperse as a produce contaminant	n	-1
7.04	Propagules adapted to wind dispersal	y	1
7.05	Propagules water dispersed		
7.06	Propagules bird dispersed		
7.07	Propagules dispersed by other animals (externally)	n	-1
7.08	Propagules dispersed by other animals (internally)		
8.01	Prolific seed production		
8.02	Evidence that a persistent propagule bank is formed (>1 yr)		
8.03	Well controlled by herbicides		
8.04	Tolerates, or benefits from, mutilation or cultivation		
8.05	Effective natural enemies present in U.S.		
<b>Total Score</b>			<b>2</b>

<b>Outcome</b>	<b>Evaluate</b>
----------------	-----------------

<b>section</b>	<b># questions answered</b>	<b>satisfy minimum?</b>
A	9	Yes
B	6	Yes
C	9	Yes
total	24	yes

Data collected 2008

Question number	Reference	Source data
1.01		used horticulturally, but no evidence of significant modification
1.02		
1.03		
2.01	<p>1. PERAL NAPPFAST Global Plant Hardiness (<a href="http://www.nappfast.org/Plant_hardiness/NAPPFAST%20Global%20zones/10-year%20climate/PLANT_HARDINESS_10YR%20Ign d.tif">http://www.nappfast.org/Plant_hardiness/NAPPFAST%20Global%20zones/10-year%20climate/PLANT_HARDINESS_10YR%20Ign d.tif</a>). 2. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (<a href="http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?311513">http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?311513</a>). 3. Paradkar, SA and Munshi, SK (1979) Some new plant records of Nagpur Region India. Journal of the Bombay Natural History Society 76(1): 209-210. 4. Taiwan Plant Names at <a href="http://www.eFloras.org">www.eFloras.org</a> (<a href="http://www.eFloras.org/florataxon.aspx?flora_id=101&amp;taxon_id=107762">http://www.eFloras.org/florataxon.aspx?flora_id=101&amp;taxon_id=107762</a>). 5. Hooker, JD (1879) The Flora of British India. Volume II. Sabiaceae to Cornaceae. L. Reeve &amp; Co., London. 6. Saldanha, CJ (1996) Flora of Karnataka. Volume II. Podostemaceae to Apiaceae. A.A. Balkema, Rotterdam and Brookfield. 7. Gangopadhyay, M and Chakrabarty, T (1997) The Family Combretaceae of Indian Subcontinent. Journal of Economic and Taxonomic Botany 21(2): 281-364. 8. Gamble, JS (1936) Flora of the Presidency of Madras. Volume I. Adlard &amp; Son, Limited, London.</p>	<p>1. Global hardiness zones (9?-)10-13. 2. Indian Subcontinent: India; Sri Lanka. 3. "From Navegaon...east of Nagpur in Bhandara District". 4. On Taiwan plant list. 5. "Throughout the Deccan Peninsula, common; and in Ceylon". 6. "India, Sri Lanka". 7. "Distribution: Sri Lanka, India (S. India, Orissa, Madhya Pradesh, Rajasthan, NE India), ? Myanmar". 8. "N. Circars, Deccan and Carnatic...W. Coast, in S. Canara".</p>
2.02		
2.03	<p>1. Köppen-Geiger climate map (<a href="http://www.hydrol-earth-syst-sci.net/11/1633/2007/hess-11-1633-2007.pdf">http://www.hydrol-earth-syst-sci.net/11/1633/2007/hess-11-1633-2007.pdf</a>). 2. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (<a href="http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?311513">http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?311513</a>). 3. Paradkar, SA and Munshi, SK (1979) Some new plant records of Nagpur Region India. Journal of the Bombay Natural History Society 76(1): 209-210. 4. Taiwan Plant Names at <a href="http://www.eFloras.org">www.eFloras.org</a> (<a href="http://www.eFloras.org/florataxon.aspx?flora_id=101&amp;taxon_id=107762">http://www.eFloras.org/florataxon.aspx?flora_id=101&amp;taxon_id=107762</a>). 5. Hooker, JD (1879) The Flora</p>	<p>1. At least two climatic regions, maybe three? 2. Indian Subcontinent: India; Sri Lanka. 3. "From Navegaon...east of Nagpur in Bhandara District". 4. On Taiwan plant list. 5. "Throughout the Deccan Peninsula, common; and in Ceylon". 6. "India, Sri Lanka". 7. "Distribution: Sri Lanka, India (S. India, Orissa, Madhya Pradesh, Rajasthan, NE India), ? Myanmar". 8. "N. Circars, Deccan and Carnatic...W. Coast, in S. Canara".</p>

	of British India. Volume II. Sabiaceae to Cornaceae. L. Reeve & Co., London. 6. Saldanha, CJ (1996) Flora of Karnataka. Volume II. Podostemaceae to Apiaceae. A.A. Balkema, Rotterdam and Brookfield. 7. Gangopadhyay, M and Chakrabarty, T (1997) The Family Combretaceae of Indian Subcontinent. Journal of Economic and Taxonomic Botany 21(2): 281-364. 8. Gamble, JS (1936) Flora of the Presidency of Madras. Volume I. Adlard & Son, Limited, London.	
2.04	1. Microsoft Encarta World Precipitation and Average Rainfall ( <a href="http://uk.encarta.msn.com/encnet/RefPages/RefMedia.aspx?refid=461530746&amp;artrefid=761554737&amp;pn=3&amp;sec=-1">http://uk.encarta.msn.com/encnet/RefPages/RefMedia.aspx?refid=461530746&amp;artrefid=761554737&amp;pn=3&amp;sec=-1</a> ). 2. Atlapedia Online ( <a href="http://www.atlapedia.com/online/countries/srilanka.htm">http://www.atlapedia.com/online/countries/srilanka.htm</a> ). 3. Climate Source ( <a href="http://www.climatesource.com/tw/fact_sheets/taippt_xl.jpg">http://www.climatesource.com/tw/fact_sheets/taippt_xl.jpg</a> ).	1. For India: Average annual precipitation for the entire country ranges from less than 10 to greater than 80 inches, however most of the country falls into the 20-60 inch range. 2. For Sri Lanka: average annual precipitation varies between 1,270 mm and 1,900 mm (50 and 75 inches) on the southeast plains to between 2,540 mm and 5,080 mm (100 and 200 inches) on the southwest plains. 3. Range for Taiwan is < 1000 mm (39.4 inches) to > 7000 mm (275.6 inches).
2.05		no evidence
3.01		no evidence
3.02		no evidence
3.03		no evidence
3.04		no evidence
3.05	Holm, L, JV Pancho, JP Herberger, and DL Plucknett (1979) A Geographical Atlas of World Weeds. John Wiley and Sons, New York.	Two congeners are principal weeds in Zimbabwe.
4.01	Hooker, JD (1879) The Flora of British India. Volume II. Sabiaceae to Cornaceae. L. Reeve & Co., London.	"Large shrubs...with long pendent or scandent branches, without spines (except <i>C. spinescens</i> )" [genus description].
4.02		
4.03	1. Hooker, JD (1879) The Flora of British India. Volume II. Sabiaceae to Cornaceae. L. Reeve & Co., London. 2. Paradkar, SA and Munshi, SK (1979) Some new plant records of Nagpur Region India.	no evidence

	Journal of the Bombay Natural History Society 76(1): 209-210. 3. Saldanha, CJ (1996) Flora of Karnataka. Volume II. Podostemaceae to Apiaceae. A.A. Balkema, Rotterdam and Brookfield. 4. Gangopadhyay, M and Chakrabarty, T (1997) The Family Combretaceae of Indian Subcontinent. Journal of Economic and Taxonomic Botany 21(2): 281-364.	
4.04		
4.05	1. Hooker, JD (1879) The Flora of British India. Volume II. Sabiaceae to Cornaceae. L. Reeve & Co., London. 2. Paradkar, SA and Munshi, SK (1979) Some new plant records of Nagpur Region India. Journal of the Bombay Natural History Society 76(1): 209-210. 3. Saldanha, CJ (1996) Flora of Karnataka. Volume II. Podostemaceae to Apiaceae. A.A. Balkema, Rotterdam and Brookfield. 4. Gangopadhyay, M and Chakrabarty, T (1997) The Family Combretaceae of Indian Subcontinent. Journal of Economic and Taxonomic Botany 21(2): 281-364.	no evidence
4.06		
4.07	1. Hooker, JD (1879) The Flora of British India. Volume II. Sabiaceae to Cornaceae. L. Reeve & Co., London. 2. Paradkar, SA and Munshi, SK (1979) Some new plant records of Nagpur Region India. Journal of the Bombay Natural History Society 76(1): 209-210. 3. Saldanha, CJ (1996) Flora of Karnataka. Volume II. Podostemaceae to Apiaceae. A.A. Balkema, Rotterdam and Brookfield. 4. Gangopadhyay, M and Chakrabarty, T (1997) The Family Combretaceae of Indian Subcontinent. Journal of Economic and Taxonomic Botany 21(2): 281-364.	no evidence
4.08		
4.09		
4.1	USDA, National Resources Conservation Services (NRCS), Soil Survey Division, World Soil Resources ( <a href="http://soils.usda.gov/use/worldsoils/mapindex/order.html">http://soils.usda.gov/use/worldsoils/mapindex/order.html</a> ).	India: alfisols spread throughout the whole country, mostly in the eastern region; small amount of entisols in northern and southernmost tip and a small amount of mollisols in the western region; Sri Lanka: almost entirely alfisols, with a very small amount of entisols on the western coast; Taiwan: entisols in the western and central parts of the

		country.
4.11	<p>1. Hooker, JD (1879) The Flora of British India. Volume II. Sabiaceae to Cornaceae. L. Reeve &amp; Co., London. 2. Paradkar, SA and Munshi, SK (1979) Some new plant records of Nagpur Region India. Journal of the Bombay Natural History Society 76(1): 209-210. 3. Saldanha, CJ (1996) Flora of Karnataka. Volume II. Podostemaceae to Apiaceae. A.A. Balkema, Rotterdam and Brookfield. 4. Gangopadhyay, M and Chakrabarty, T (1997) The Family Combretaceae of Indian Subcontinent. Journal of Economic and Taxonomic Botany 21(2): 281-364. 5. Chavan, AR and Oza, GM (1966) The Flora of Pavagadh (Gujarat State, India). The Maharaja Sayajirao University of Baroda Botanical Memoirs: no. 1. University of Baroda, Baroda [India]. 6. Gamble, JS (1936) Flora of the Presidency of Madras. Volume I. Adlard &amp; Son, Limited, London.</p>	<p>1, 2. "A large scandent shrub" [species description]. 1. "Large shrubs...with long pendent or scandent branches" [genus description]. 3. "Woody climbers" [genus description]. 4. "Liana or creeper". 5. "A climber". 6. "A large climbing shrub".</p>
4.12		
5.01		terrestrial
5.02	<p>USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (<a href="http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?311513">http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?311513</a>).</p>	Combretaceae
5.03	<p>USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (<a href="http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?311513">http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?311513</a>).</p>	Combretaceae
5.04	<p>1. Hooker, JD (1879) The Flora of British India. Volume II. Sabiaceae to Cornaceae. L. Reeve &amp; Co., London. 2. Paradkar, SA and Munshi, SK (1979) Some new plant records of Nagpur Region India. Journal of the Bombay Natural History Society 76(1): 209-210. 3. Saldanha, CJ (1996) Flora of Karnataka. Volume II. Podostemaceae to Apiaceae. A.A. Balkema, Rotterdam and Brookfield. 4. Gangopadhyay, M and Chakrabarty, T (1997) The Family Combretaceae of Indian Subcontinent. Journal of Economic and Taxonomic Botany 21(2): 281-364. 5. Chavan, AR and Oza, GM (1966) The Flora of Pavagadh (Gujarat State, India). The Maharaja Sayajirao University of Baroda Botanical</p>	<p>1, 2. "A large scandent shrub" [species description]. 1. "Large shrubs...with long pendent or scandent branches" [genus description]. 3. "Woody climbers" [genus description]. 4. "Liana or creeper". 5. "A climber". 6. "A large climbing shrub".</p>

	Memoirs: no. 1. University of Baroda, Baroda [India]. 6. Gamble, JS (1936) Flora of the Presidency of Madras. Volume I. Adlard & Son, Limited, London.	
6.01		no evidence
6.02		
6.03		
6.04		
6.05		
6.06		
6.07		
7.01		
7.02		no evidence
7.03		no evidence
7.04	1. Hooker, JD (1879) The Flora of British India. Volume II. Sabiaceae to Cornaceae. L. Reeve & Co., London. 2. Paradkar, SA and Munshi, SK (1979) Some new plant records of Nagpur Region India. Journal of the Bombay Natural History Society 76(1): 209-210. 3. Saldanha, CJ (1996) Flora of Karnataka. Volume II. Podostemaceae to Apiaceae. A.A. Balkema, Rotterdam and Brookfield. 4. Gangopadhyay, M and Chakrabarty, T (1997) The Family Combretaceae of Indian Subcontinent. Journal of Economic and Taxonomic Botany 21(2): 281-364. 5. Chavan, AR and Oza, GM (1966) The Flora of Pavagadh (Gujarat State, India). The Maharaja Sayajirao University of Baroda Botanical Memoirs: no. 1. University of Baroda, Baroda [India].	1. "Fruit 3/4 in. long and nearly the same in breadth" [species description]; "Fruit with 4-5 wings angles or ridges, dry, generally indehiscent. Seed 1; cotyledons plaited or flat, in a few species convoluted" [genus description]. 2. "Fruit...with four papery finely transversely striate wings". 3. "Fruits to 2.5 x 2.2 cm"; "Fruit ovoid with 4 membranous wings" [species description]; "Fruit 4-5-angled or winged" [genus description]. 4. "Fruits: orbicular to obcordate in outline, 1.7-2.5 x 1.7-3 cm...wings 4, 1.5-2.5 x 0.8-1.2 cm, thinly chartaceous". 5. "Fruit with 4 papery wings."
7.05		
7.06		
7.07	1. Hooker, JD (1879) The Flora of British India. Volume II. Sabiaceae to Cornaceae. L. Reeve & Co., London. 2. Paradkar, SA and Munshi, SK (1979) Some new plant records of Nagpur Region India. Journal of the Bombay Natural History Society 76(1): 209-210. 3. Saldanha, CJ (1996) Flora of Karnataka. Volume II. Podostemaceae to Apiaceae. A.A. Balkema, Rotterdam and Brookfield. 4. Gangopadhyay, M and Chakrabarty, T (1997) The Family Combretaceae of Indian Subcontinent. Journal of Economic and Taxonomic Botany 21(2): 281-364. 5. Chavan, AR and Oza, GM (1966) The Flora of Pavagadh (Gujarat State, India). The	1. "Fruit 3/4 in. long and nearly the same in breadth" [species description]; "Fruit with 4-5 wings angles or ridges, dry, generally indehiscent. Seed 1; cotyledons plaited or flat, in a few species convoluted" [genus description]. 2. "Fruit...with four papery finely transversely striate wings". 3. "Fruits to 2.5 x 2.2 cm"; "Fruit ovoid with 4 membranous wings" [species description]; "Fruit 4-5-angled or winged" [genus description]. 4.

	Maharaja Sayajirao University of Baroda Botanical Memoirs: no. 1. University of Baroda, Baroda [India].	"Fruits: orbicular to obcordate in outline, 1.7-2.5 × 1.7-3 cm...wings 4, 1.5-2.5 × 0.8-1.2 cm, thinly chartaceous". 5. "Fruit with 4 papery wings." [no evidence of adaptations to external dispersal]
7.08		
8.01		
8.02		
8.03		
8.04		
8.05		