

<b><i>Bauhinia purpurea</i> (Butterfly tree, Purple orchid tree)</b>		<b>Answer</b>	<b>Score</b>
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 FL 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)	y	1
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?	y	
3.01	Naturalized beyond native range	y	2
3.02	Garden/amenity/disturbance weed	n	0
3.03	Weed of agriculture	n	0
3.04	Environmental weed	y	4
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	n	0
4.09	Is a shade tolerant plant at some stage of its life cycle	?	
4.10	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils). North & Central Zones: infertile soils; South Zone: shallow limerock or Histisols.	?	
4.11	Climbing or smothering growth habit	n	0
4.12	Forms dense thickets	?	
5.01	Aquatic	n	0
5.02	Grass	n	0
5.03	Nitrogen fixing woody plant	y	1
5.04	Geophyte	n	0
6.01	Evidence of substantial reproductive failure in native habitat	n	0
6.02	Produces viable seed	y	1
6.03	Hybridizes naturally	y?	1
6.04	Self-compatible or apomictic	y	1
6.05	Requires specialist pollinators	n	0
6.06	Reproduction by vegetative propagation		
6.07	Minimum generative time (years)	3	0
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
7.02	Propagules dispersed intentionally by people	y	1
7.03	Propagules likely to disperse as a produce contaminant	n	-1
7.04	Propagules adapted to wind dispersal	n	-1
7.05	Propagules water dispersed		
7.06	Propagules bird dispersed	n	-1
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	y	-1
8.04	Tolerates, or benefits from, mutilation or cultivation		
8.05	Effective natural enemies present in U.S.		
<b>Total Score</b>		<b>10</b>	
<b>Implemented Pacific Second Screening</b>		<b>n/a</b>	
<b>Risk Assessment Results</b>		<b>High Risk</b>	

section	# questions answered	satisfy minimum?
A		11 yes
B		6 yes
C		15 yes
total		32 yes

	Reference	Source data
1.01		cultivated, but no evidence of selection for reduced weediness
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%20lgnd.tif">http://www.nappfast.org/Plant_hardiness/NAPPFAST%20Global%20zones/10-year%20climate/PLANT_HARDINESS_10YR%20lgnd.tif</a>). 2. Gilman, EF and Watson, DG (2003) <i>Bauhinia purpurea</i>: Purple Orchid-Tree. ENH249, University of Florida, IFAS Extension (<a href="http://edis.ifas.ufl.edu/pdffiles/ST/ST09000.pdf">http://edis.ifas.ufl.edu/pdffiles/ST/ST09000.pdf</a>). 3. 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?6590">http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?6590</a>). 4. Connor (2002) <i>Bauhinia purpurea</i> DC. ex Walp. Tropical Tree Seed Manual, Species Descriptions. Reforestation, Nurseries, and Genetics Resources (<a href="http://www.rngr.net/Publications/ttsm/Folder.2003-07-11.4726/PDF.2003-11-12.1754/file">http://www.rngr.net/Publications/ttsm/Folder.2003-07-11.4726/PDF.2003-11-12.1754/file</a>).</p>	<p>1. Global plant hardiness zones 9-13. 2. USDA hardiness zones: 9B through 11. 3. "Indian Subcontinent: Bhutan; India; Nepal; Pakistan [e.]; Sri Lanka; Indo-China: Myanmar; Thailand; cultivated throughout tropics". 4. "<i>Bauhinia purpurea</i> is a native of southeastern Asia from India to China and is planted in Florida, Hawaii, Puerto Rico, the Virgin Islands, and elsewhere in tropical America."</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?6590">http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?6590</a>). 3. Connor (2002) <i>Bauhinia purpurea</i> DC. ex Walp. Tropical Tree Seed Manual, Species Descriptions. Reforestation, Nurseries, and Genetics Resources (<a href="http://www.rngr.net/Publications/ttsm/Folder.2003-07-11.4726/PDF.2003-11-12.1754/file">http://www.rngr.net/Publications/ttsm/Folder.2003-07-11.4726/PDF.2003-11-12.1754/file</a>).</p>	<p>1. Distribution in the native and cultivated ranges is very widespread, so there are most likely at least 3 climatic groups. 2. "Indian Subcontinent: Bhutan; India; Nepal; Pakistan [e.]; Sri Lanka; Indo-China: Myanmar; Thailand; cultivated throughout tropics". 3. "<i>Bauhinia purpurea</i> is a native of southeastern Asia from India to China and is planted in Florida, Hawaii, Puerto Rico, the Virgin Islands, and elsewhere in tropical America."</p>
2.04	<p>1. Atlapedia Online (<a href="http://www.atlapedia.com/online/countries/bhutan.htm">http://www.atlapedia.com/online/countries/bhutan.htm</a>). 2. Microsoft Encarta World Precipitation and Average Rainfall (<a href="http://uk.encarta.msn.com/encnet/RefPages/RefMedia.aspx?refid=461530746&amp;artefid=761554737&amp;pn=3&amp;sec=-1">http://uk.encarta.msn.com/encnet/RefPages/RefMedia.aspx?refid=461530746&amp;artefid=761554737&amp;pn=3&amp;sec=-1</a>). 3. Atlapedia Online (<a href="http://www.atlapedia.com/online/countries/nepal.htm">http://www.atlapedia.com/online/countries/nepal.htm</a>). 4. Atlapedia Online (<a href="http://www.atlapedia.com/online/countries/pakistan.htm">http://www.atlapedia.com/online/countries/pakistan.htm</a>). 5. Atlapedia Online (<a href="http://www.atlapedia.com/online/countries/srilanka.htm">http://www.atlapedia.com/online/countries/srilanka.htm</a>). 6. Atlapedia Online (<a href="http://www.atlapedia.com/online/countries/myanmar.htm">http://www.atlapedia.com/online/countries/myanmar.htm</a>). 7. Atlapedia Online (<a href="http://www.atlapedia.com/online/countries/thailand.htm">http://www.atlapedia.com/online/countries/thailand.htm</a>). 8. Atlapedia Online (<a href="http://www.atlapedia.com/online/countries/puertori.htm">http://www.atlapedia.com/online/countries/puertori.htm</a>).</p>	<p>1. For Bhutan: "Average annual precipitation varies from 1,020 to 1,520 mm (40 to 60 inches)". 2. 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. 3. For Nepal: "Average annual precipitation decreases from 1,778 mm (70 inches) in the east to 899 mm (35 inches) in the west." 4. For Pakistan: "Average annual precipitation varies from 1,520 mm (60 inches) to 127 mm (5 inches) depending on the region." 5. 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. 6. For Myanmar: "The coastal and high mountain precipitation varies between 2,500 to 5,000 mm (98 to 196 inches) annually with the interior receiving 1,000 mm (39 inches) or less." 7. For Thailand: "Average annual precipitation varies from 1,020 mm (40 inches) to 2,030 mm (80 inches) depending on the region." 8. For Puerto Rico: "Average annual precipitation varies from 1,550 mm (161 inches) in the north to 910 mm (36 inches) in the south."</p>

2.05	PIER, Institute of Pacific Islands Forestry ( <a href="http://www.hear.org/pier/species/bauhinia_purpurea.htm">http://www.hear.org/pier/species/bauhinia_purpurea.htm</a> )	Widely cultivated throughout the tropics.
3.01	1. Kairo, Ali, Cheesman, Haysom, and Murphy (2003) Invasive Species Threats in the Caribbean Region. Report to the Nature Conservancy. 2. PIER, Institute of Pacific Islands Forestry ( <a href="http://www.hear.org/pier/species/bauhinia_purpurea.htm">http://www.hear.org/pier/species/bauhinia_purpurea.htm</a> ) 3. Henderson (2001) Alien Weeds and Invasive Plants: a Complete Guide to Declared Weeds and Invaders in South Africa. Plant Protection Research Institute Handbook No. 12.	1. Considered naturalized in Puerto Rico. 2. Possibly sparingly naturalized along roadsides in Fiji. 3. Naturalized in South Africa.
3.02		no evidence
3.03		no evidence
3.04	Henderson (2001) Alien Weeds and Invasive Plants: a Complete Guide to Declared Weeds and Invaders in South Africa. Plant Protection Research Institute Handbook No. 12.	Considered a category 3 invader in South Africa - invades savanna, coastal bush, riverbanks, urban open space.
3.05	1. Henderson (2001) Alien Weeds and Invasive Plants: a Complete Guide to Declared Weeds and Invaders in South Africa. Plant Protection Research Institute Handbook No. 12. 2. Kairo, Ali, Cheesman, Haysom, and Murphy (2003) Invasive Species Threats in the Caribbean Region. Report to the Nature Conservancy.	B. variegata considered a category 3 invader in South Africa (1), and considered naturalized and invasive in the Bahamas (2).
4.01	Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	no description of these traits
4.02	Chou (1980) Allelopathic researches in the subtropical vegetation in Taiwan. Comparative Physiology and Ecology 5: 222-234.	"The species that exhibited allelopathy or allelopathic-like patterns included...Bauhinia purpurea..."
4.03	Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	no description of parasitism
4.04	Singh (2001) Leaf morphology and leaf area of fodder trees of NEH region. Range Management and Agroforestry 22: 85-93.	An important fodder species in India [unclear whether eaten readily].
4.05	1. Henderson (2001) Alien Weeds and Invasive Plants: a Complete Guide to Declared Weeds and Invaders in South Africa. Plant Protection Research Institute Handbook No. 12. 2. Singh (2001) Leaf morphology and leaf area of fodder trees of NEH region. Range Management and Agroforestry 22: 85-93.	1. Not indicated to be poisonous. 2. An important fodder species in India.
4.06		
4.07	1. Henderson (2001) Alien Weeds and Invasive Plants: a Complete Guide to Declared Weeds and Invaders in South Africa. Plant Protection Research Institute Handbook No. 12. 2. Connor (2003) Bauhinia purpurea DC. ex Walp. Tropical Tree Seed Manual, Species Descriptions. Reforestation, Nurseries, and Genetics Resources ( <a href="http://www.rngr.net/Publications/ttsm/Folder.2003-07-11.4726/PDF.2003-11-12.1754/file">http://www.rngr.net/Publications/ttsm/Folder.2003-07-11.4726/PDF.2003-11-12.1754/file</a> ).	1. Not indicated to be poisonous or an irritant. 2. "The leaves are edible".
4.08		no evidence
4.09	1. Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida. 2. Hortocopia 4.0	1. Full sun to partial shade. 2. Partial shade or partial sun to full sun (BUT "should be grown in full sun").
4.10	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> ). 2. Connor (2002) Bauhinia purpurea DC. ex Walp. Tropical Tree Seed Manual, Species Descriptions. Reforestation, Nurseries, and Genetics Resources ( <a href="http://www.rngr.net/Publications/ttsm/Folder.2003-07-11.4726/PDF.2003-11-12.1754/file">http://www.rngr.net/Publications/ttsm/Folder.2003-07-11.4726/PDF.2003-11-12.1754/file</a> ). 3. Hortocopia 4.0.	1. Histisols occur in the region of origin, but distribution information is not specific enough to determine if they occur concurrently with this species. 2. "The species does not grow well on nutrient-poor...sites." BUT 3. "Suitable soil is well-drained/loamy, sandy, or clay." [reference #2 more specific].

4.11	Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	Form: tree.
4.12		no evidence
5.01		terrestrial
5.02	Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	Fabaceae
5.03	1. Domingo (1983) Nitrogen fixation in Southeast Asian forestry: research and practice. Pp. 295-315 in Gordon and Wheeler (eds.) Biological Nitrogen Fixation in Forest Ecosystems: Foundations and Applications. Martinus Nijhoff / Dr W. Junk Publishers, The Hague. 2. Pokhriyal, Bhandari, Negi, Chaukiyal, and Gupta (1990) Identification of some fast growing leguminous tree species for nitrogen fixation studies. Indian Forester 116: 504-507.	1. <i>B. purpurea</i> on list of southeast Asian forestry species from which Rhizobia were isolated. BUT 2. <i>Bauhinia purpurea</i> not found to produce nodules.
5.04	Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	Form: tree.
6.01		no evidence
6.02	1. Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida. 2. Hortocopia 4.0	1. Propagate by seed. 2. "Abundant seedlings...may germinate in the landscape".
6.03	Lau, Ramsden, and Saunders (2005) Hybrid origin of " <i>Bauhinia blakeana</i> " (Leguminosae:Caesalpinioideae), inferred using morphological, reproductive, and molecular data. American Journal of Botany 92: 525-533.	" <i>Bauhinia blakeana</i> ...is shown here to be the result of hybridization between the largely sympatric species, <i>B. purpurea</i> and <i>B. variegata</i> ." Hybridization "probably natural" - paper demonstrates that it is feasible for the two species to interbreed.
6.04	1. Lau, Ramsden, and Saunders (2005) Hybrid origin of " <i>Bauhinia blakeana</i> " (Leguminosae:Caesalpinioideae), inferred using morphological, reproductive, and molecular data. American Journal of Botany 92: 525-533. 2. Reddi and Rao (1993) Pollination ecology of <i>Bauhinia purpurea</i> (Caesalpinaceae). Journal of Palynology 29: 115-124.	1. <i>B. purpurea</i> set fruit when self-pollinated (though xenogamy is promoted). 2. "Dichogamy of the flowers involving differential maturation of sexual organs precludes autogamy. The availability of male phase and female phase flowers on a plant on a particular day facilitates geitonogamy."
6.05	Lau, Ramsden, and Saunders (2005) Hybrid origin of " <i>Bauhinia blakeana</i> " (Leguminosae:Caesalpinioideae), inferred using morphological, reproductive, and molecular data. American Journal of Botany 92: 525-533.	<i>B. purpurea</i> pollinated by several species of bees, wasps, and butterflies (pollen observed adhering to the bodies of the pollinators).
6.06		
6.07	Connor (2003) <i>Bauhinia purpurea</i> DC. ex Walp. Tropical Tree Seed Manual, Species Descriptions. Reforestation, Nurseries, and Genetics Resources ( <a href="http://www.rngr.net/Publications/ttsm/Folder.2003-07-11.4726/PDF.2003-11-12.1754/file">http://www.rngr.net/Publications/ttsm/Folder.2003-07-11.4726/PDF.2003-11-12.1754/file</a> ).	" <i>Bauhinia</i> spp. bloom within 3 or 4 years".
7.01		
7.02	PIER, Institute of Pacific Islands Forestry ( <a href="http://www.hear.org/pier/species/bauhinia_purpurea.htm">http://www.hear.org/pier/species/bauhinia_purpurea.htm</a> )	Widely cultivated throughout the tropics.
7.03		propagules unlikely to come into contact with produce
7.04	Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	Fruit is a woody pod. [no evidence of adaptations to wind dispersal]
7.05		
7.06	1. Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida. 2. Gilman and Watson (2003) <i>Bauhinia purpurea</i> : purple orchid-tree. ENH249, University of Florida, IFAS Extension ( <a href="http://edis.ifas.ufl.edu/pdf/files/ST/ST09000.pdf">http://edis.ifas.ufl.edu/pdf/files/ST/ST09000.pdf</a> ).	1. Fruit is a woody pod. 2. "Does not attract wildlife".
7.07	Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	Fruit is a woody pod. [no evidence of adaptations to external dispersal]

7.08		
8.01		
8.02	Connor (2003) <i>Bauhinia purpurea</i> DC. ex Walp. Tropical Tree Seed Manual, Species Descriptions. Reforestation, Nurseries, and Genetics Resources ( <a href="http://www.rngr.net/Publications/ttsm/Folder.2003-07-11.4726/PDF.2003-11-12.1754/file">http://www.rngr.net/Publications/ttsm/Folder.2003-07-11.4726/PDF.2003-11-12.1754/file</a> ).	hard-seeded legume
8.03	Langeland and Stocker (2001) Control of non-native plants in natural areas of Florida. University of Florida, IFAS Extension, SP 242 ( <a href="http://edis.ifas.ufl.edu/pdffiles/WG/WG20900.pdf">http://edis.ifas.ufl.edu/pdffiles/WG/WG20900.pdf</a> ).	"Basal bark application of 10% Garlon 4 or application of 50% Garlon 3A to cut stump; All methods listed have been found effective under certain circumstances."
8.04		
8.05		No evidence found.