

Assessment date 14 April 2016

<i>Plumbago auriculata</i> ALL ZONES		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 Florida's USDA climate zones (0-low; 1-intermediate; 2-high) North Zone: suited to Zones 8, 9 Central Zone: suited to Zones 9, 10 South Zone: suited to Zone 10	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 habitats with periodic inundation North Zone: mean annual precipitation 50-70 inches Central Zone: mean annual precipitation 40-60 inches South Zone: mean annual precipitation 40-60 inches	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	n	0
3.05	Congeneric weed	y	2
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic	unk	0
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals	y	1
4.05	Toxic to animals	unk	0
4.06	Host for recognised pests and pathogens	n	0
4.07	Causes allergies or is otherwise toxic to humans	y	1
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	n	0
4.10	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils). North & Central Zones: infertile soils; South Zone: shallow limerock or Histisols.	unk	0
4.11	Climbing or smothering growth habit	n	0
4.12	Forms dense thickets	unk	0
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	y	1

6.03	Hybridizes naturally	unk	-1
6.04	Self-compatible or apomictic	unk	-1
6.05	Requires specialist pollinators	n	0
6.06	Reproduction by vegetative propagation	y	1
6.07	Minimum generative time (years)	2	0
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	unk	-1
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	unk	-1
7.05	Propagules water dispersed	unk	-1
7.06	Propagules bird dispersed	unk	-1
7.07	Propagules dispersed by other animals (externally)	y	1
7.08	Propagules dispersed by other animals (internally)	n	-1
8.01	Prolific seed production		
8.02	Evidence that a persistent propagule bank is formed (>1 yr)	n	-1
8.03	Well controlled by herbicides	unk	1
8.04	Tolerates, or benefits from, mutilation or cultivation	unk	-1
8.05		?	
Total Score		3	
Implemented Pacific Second Screening		yes	
Risk Assessment Results		Low	

section	# questions answered	satisfy minimum?
A		11 yes
B		8 yes
C		14 yes
total		33 yes

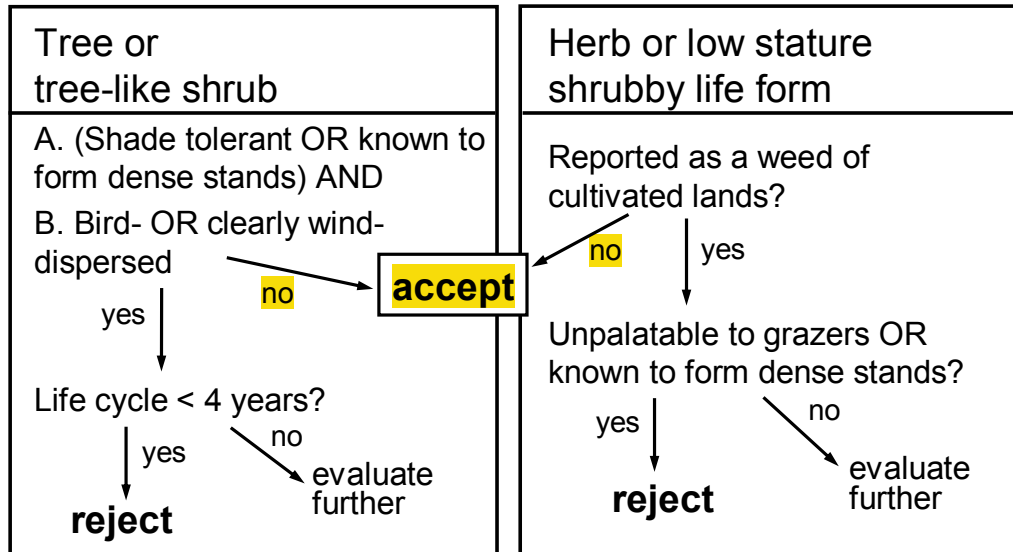
	Reference	Source data
1.01		cultivated, but no evidence of selection for reduced weediness
1.02		
1.03		
2.01	1. PERAL NAPPFAST Global Plant Hardiness (http://www.nappfast.org/Plant_hardiness/NAPPFAST%20Global%20zones/10-year%20climate/PLANT_HARDINESS_10YR%20lgnnd.tif). 2. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?409896 (3-11-2016).	No computer analysis was performed. 1. Global hardiness zone: 9, 10, 11 ; equivalent to USDA Hardiness zones: 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) USDA Zone 11a: to USDA Zone (40 °F) USDA Zone 11b: to (45 °F) USDA . 2. Native to South Tropical Africa: Mozambique Southern Africa: South Africa - Cape Province, - KwaZulu-Natal, - Free State, - Transvaal
2.02		
2.03	1. Köppen-Geiger climate map (http://www.hydrol-earth-syst-sci.net/11/1633/2007/hess-11-1633-2007.pdf). 2. GBIF http://www.gbif.org/species/3082283 (3-11-2016)	1. Distribution in the native/cultivated range occurs in Aw, Cfb, Csa, Cfa, Bsk, Bwk
2.04	1. Climate Charts. World Climate Maps. http://www.climate-charts.com/World-Climate-Maps.html#rain (8-19-2015)	Native to regions with 5 inches to 58 inches of rainfall annually.
2.05	1. Encyclopedia of Life http://eol.org/pages/484539/details (3-11-2016) 2. Kamehameha http://kms.kapalama.ksbe.edu/projects/2003/plants/plumbago/ (3-15-2016)	1. widely cultivated beyond native range 2. Plumbago auriculata was introduced to the Hawaiian Islands
3.01	1. Wildlife of Hawaii http://wildlifeofhawaii.com/flowers/1141/plumbago-auriculata-plumbago/ (3-11-2016) 2. LUTEYN, J. L.. (1990). THE PLUMBAGINACEAE IN THE FLORA OF THE SOUTHEASTERN UNITED STATES. SIDA, Contributions to Botany, 14(2), 169–178.	1. This minimally naturalized and widely cultivated ornamental garden plant is native to southern Africa. 2. Naturalized in the South Eastern United States
3.02		no evidence
3.03		no evidence
3.04		no evidence
3.05	1. Holm, LeRoy G. A Geographical Atlas of World Weeds. Malabar, FL: Krieger Pub., 1991. Print.	Plumbago zeylancia is a common weed in Hawaii
4.01	1. Encyclopedia of Life http://eol.org/pages/484539/details (3-11-2016)	no evidence of these features
4.02		no evidence
4.03	1. Encyclopedia of Life http://eol.org/pages/484539/details (3-11-2016)	no evidence
4.04	1. Dave's Garden http://davesgarden.com/guides/pf/go/414/#b (3-11-2016) 2. Texas A and M University Extension http://aggie-horticulture.tamu.edu/archives/parsons/publications/deerbest.html (3-15-2016)	1. This plant is resistant to deer 2. Listed as a deer resistant plant
4.05		no evidence, but is both toxic to humans and unpalatable to grazers
4.06	1. University of Florida IFAS Extension https://edis.ifas.ufl.edu/fp487 (3-11-2016)	1. Pest resistance: long-term health usually not affected by pests
4.07	1. Dave's Garden http://davesgarden.com/guides/pf/go/414/#b (3-11-2016) 2. Wildlife of Hawaii http://wildlifeofhawaii.com/flowers/1141/plumbago-auriculata-plumbago/ (3-11-2016) 3. NC State Extension https://plants.ces.ncsu.edu/plants/all/plumbago-auriculata/ (3-11-2016)	1. All parts of plant are poisonous if ingested 2. The plants are poisonous. 3. Poison Delivery Mode: Dermatitis. Symptoms: Irritation, redness, and blistering following contact. Toxic Principle: Plumbagin, a quinone. Severity:SKIN IRRITATION SEVERE!
4.08		no evidence

4.09	1. Missouri Botanical Garden http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=a542 (3-11-2016) 2. University of Florida IFAS Extension https://edis.ifas.ufl.edu/fp487 (3-11-2016) 3. World Heritage Encyclopedia http://www.gutenberg.us/articles/plumbago_auriculata (3-15-2016)	1. Full Sun 2. Needing full sun for best growth and flowering 3. Plumbago grow best in full sun to part shade.
4.10		Lack of evidence
4.11	1. Encyclopedia of Life http://eol.org/pages/484539/details (3-11-2016)	1. sometimes semi-climbing
4.12	1. South African Biodiversity Institute http://www.plantzafrica.com/plantnop/plumbago.htm (3-11-2016)	1. Plumbago makes a good, fast growing "exclusion zone" or bush-clump plant for attracting birds such as robins which like dense plant growth.
5.01		Family: Plumbaginaceae
5.02		Family: Plumbaginaceae
5.03	1. Encyclopedia of Life http://eol.org/pages/484539/details (3-11-2016)	Not a woody species
5.04	1. Encyclopedia of Life http://eol.org/pages/484539/details (3-11-2016)	No evidence of these features
6.01		no evidence
6.02	1. University of Florida IFAS Extension https://edis.ifas.ufl.edu/fp487 (3-11-2016) 2. South African Biodiversity Institute http://www.plantzafrica.com/plantnop/plumbago.htm (3-11-2016)	1. Propagation is by seed, cuttings, or division 2. Plumbago is propagated easily from seed, cuttings and suckers.
6.03		no evidence
6.04	1. Zhao Zhi Hui. 2012. Preliminary Studies on Biological Characteristics of Plumbago Auriculata. Sichuan Agricultural University	1. <i>P. auriculata</i> was a typical style heterotypic plants, and has a self-incompatibility
6.05	1. Ferrero, V., de Vega, C., Stafford, G. I., Van Staden, J. & Johnson, S. D. 2009. Heterostyly and pollinators in <i>Plumbago auriculata</i> (Plumbaginaceae). South African Journal of Botany 75: 778–784. 2. South African Biodiversity Institute http://www.plantzafrica.com/plantnop/plumbago.htm (3-11-2016) 3. University of Florida IFAS Extension https://edis.ifas.ufl.edu/fp487 (3-11-2016)	1. During the period of this study (November and December, 2008), long-proboscid flies (<i>Philoliche aethiopica</i> , Tabanidae) were the primary visitors to flowers of <i>P. auriculata</i> at the Richmond study site with occasional visits by the large swallowtail butterflies, <i>Papilio demodocus</i> and <i>P. nireus</i> , smaller <i>Pieris</i> butterflies (Lepidoptera) and small, pollen-collecting bees in the family Halictidae 2. Plumbago is visited by butterflies and is one of the larval foods plant for the common blue butterfly 3. attracts butterflies
6.06	1. Grow Plants (http://www.growplants.org/growing/plumbago-auriculata accessed 14 April 2016) 2. University of Florida IFAS Extension https://edis.ifas.ufl.edu/fp487 (3-11-2016) 3. Dave's Garden http://davesgarden.com/guides/pf/go/414/#b (3-11-2016)	1. The best way to propagate <i>Plumbago auriculata</i> : Plant / Seed / Vegetative Reproduction 2. Propagation is by seed, cuttings, or division 2. Propagated by dividing the rootball
6.07	1. Fine Gardening http://www.finegardening.com/cape-leadwort-plumbago-auriculata (3-16-2016)	takes 2 years to flower
7.01	1. Encyclopedia of Life http://eol.org/pages/484539/details (3-11-2016)	1. Hummocks, thickets, dis-turbed sites
7.02	1. Encyclopedia of Life http://eol.org/pages/484539/details (3-11-2016)	1. Widely cultivated outside native range
7.03		no evidence
7.04	1. Encyclopedia of Life http://eol.org/pages/484539/details (3-11-2016)	1. Capsules 8 mm. Seeds brown, 7 mm. [very small seeds, wind dispersal possible]
7.05	1. Encyclopedia of Life http://eol.org/pages/484539/details (3-11-2016)	1. Capsules 8 mm. Seeds brown, 7 mm. [very small seeds, water dispersal possible]
7.06		no evidence
7.07	1. South African Biodiversity Institute http://www.plantzafrica.com/plantnop/plumbago.htm (3-11-2016) 2. Wildlife of Hawaii http://wildlifeofhawaii.com/flowers/1141/plumbago-auriculata-plumbago/ (3-11-2016)	1. There are sticky, gland tipped hairs on the flower calyx. The seed capsule retains the stickiness which presumably helps disperse the seed by attaching to animals. 2. sticky seed capsules.
7.08		no evidence of consumption
8.01	1. Encyclopedia of Life http://eol.org/pages/484539/details (3-11-2016)	1. Capsules 8 mm. Seeds brown, 7 mm.

8.02	1. Zhao Zhi Hui. 2012. Preliminary Studies on Biological Characteristics of Plumbago Auriculata. Sichuan Agricultural University http://www.research001.com/?showinfo-224-783727-0.html	1. <i>P. auriculata</i> seed does not have dormancy characteristic.
8.03		no evidence
8.04		no evidence
8.05		no evidence

Pacific second screening: decision rules for species with WRA scores between 1 and 6

(from Daehler *et al.* 2004)



Vines must pass both tests