

Taxon: Clerodendrum japonicum	Family: Verbenaceae
Common Name(s): cheng tong Japanese glory bower	Synonym(s): Clerodendrum kaempferi (Jacq.) Clerodendrum squamatum Vahl Volkameria japonica Thunb. Volkameria kaempferi Jacq.

Assessor: Chuck Chimera	Status: In Progress	End Date:
WRA Score: 7.0	Designation: H(HPWRA)	Rating: High Risk

Keywords: Tropical Shrub, Naturalized, Ornamental, Suckers, Bird-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	y
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	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed		
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed		
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y
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	y=1, n=0	n

Qsn #	Question	Answer Option	Answer
409	Is a shade tolerant plant at some stage of its life cycle		
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)		
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets		
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		
604	Self-compatible or apomictic		
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
607	Minimum generative time (years)		
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	n
705	Propagules water dispersed		
706	Propagules bird dispersed	y=1, n=-1	y
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m ²)		
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides	y=-1, n=1	y
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
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	No evidence

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2015. 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, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed 11 Aug 2015]	"Native: ASIA-TEMPERATE China: China - Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangsu, Jiangxi [s.], Sichuan, Xizang, Yunnan, Zhejiang [s.] Eastern Asia: Taiwan ASIA-TROPICAL Indian Subcontinent: Bangladesh; India - Assam Indo-China: Laos; Vietnam Malesia: Indonesia - Celebes, Java; Malaysia"

202	Quality of climate match data	High
	Source(s)	Notes
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed]	

203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes

Qsn #	Question	Answer
	Mazza, G. 2015. <i>Clerodendrum japonicum</i> . http://www.photomazza.com/?Clerodendrum-japonicum . [Accessed 14 Aug 2015]	"Species diffused in nature in a vast area of South-East Asia, but relatively little utilized as ornamental in parks and gardens, cultivable in the tropical and subtropical climate regions and marginally in the temperate warm ones, where it can resist to exceptional drops of temperature just under the 0 °C, with possible damage to the aerial part."
	Plants for a Future. 2015. <i>Clerodendrum japonicum</i> . http://www.pfaf.org/user/Plant.aspx?LatinName=Clerodendrum+japonicum . [Accessed 13 Aug 2015]	"USDA hardiness zone : 9-11"
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	[Elevation range exceeds 1000 m, demonstrating environmental versatility] "Thickets in valleys, along streams, in grassy openings; 100–1200 m."

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	Rueda, R. M. (1993). The genus <i>Clerodendrum</i> (verbenaceae) in Mesoamerica. <i>Annals of the Missouri Botanical Garden</i> , 80(4): 870-890	"Distribution and habitat. <i>Clerodendrum japonicum</i> is native to Nepal, China, and upper Burma. It is also cultivated in tropical and subtropical regions and naturalized in Japan, Brazil, and Mexico. In Mexico this species is found in secondary deciduous forest, in secondary middle elevation forest on rocky soil, and in coffee fields, at altitudes up to 1,300 m."

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed 13 Aug 2015]	"Naturalized: ASIA-TROPICAL Indian Subcontinent: Bhutan NORTHERN AMERICA Mexico SOUTHERN AMERICA Northern South America: Guyana; Suriname Brazil: Brazil"

301	Naturalized beyond native range	y
	Source(s)	Notes
	Lance, R. 2004. <i>Woody Plants of the Southeastern United States: A Winter Guide</i> . University of Georgia Press, Athens, GA	"A shrub. less commonly naturalized; reported as an escape in a few coastal plain sites in GA. FL."
	Rueda, R. M. (1993). The genus <i>Clerodendrum</i> (verbenaceae) in Mesoamerica. <i>Annals of the Missouri Botanical Garden</i> , 80(4): 870-890	"Distribution and habitat. <i>Clerodendrum japonicum</i> is native to Nepal, China, and upper Burma. It is also cultivated in tropical and subtropical regions and naturalized in Japan, Brazil, and Mexico. In Mexico this species is found in secondary deciduous forest, in secondary middle elevation forest on rocky soil, and in coffee fields, at altitudes up to 1,300 m."

Qsn #	Question	Answer
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed 13 Aug 2015]	"Naturalized: ASIA-TROPICAL Indian Subcontinent: Bhutan NORTHERN AMERICA Mexico SOUTHERN AMERICA Northern South America: Guyana; Suriname Brazil: Brazil"
	Moktan, S., & Das, A. P. (2013). Diversity and distribution of invasive alien plants along the altitudinal gradient in Darjiling Himalaya, India. <i>Pleione</i> 7(2): 305-313	"Table 1: Summary of the Invasive alien plants in Darjiling Himalaya" [Includes <i>Clerodendrum japonicum</i>]

302	Garden/amenity/disturbance weed	
	Source(s)	Notes
	Wearn, J. A., & Mabberley, D. J. (2011). <i>Clerodendrum</i> (Lamiaceae) in Borneo. <i>Systematic Botany</i> , 36(4): 1050-1061	[Disturbance adapted] "Some species are early successional colonizers of degraded land (e.g. <i>C. japonicum</i> (Thunb.) Sweet) and could be used for habitat restoration..."
	Randall, R.P. 2012. <i>A Global Compendium of Weeds</i> . 2nd Edition. Department of Agriculture and Food, Western Australia	Included in a number of references of weeds.

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

304	Environmental weed	
	Source(s)	Notes
	Randall, R.P. 2012. <i>A Global Compendium of Weeds</i> . 2nd Edition. Department of Agriculture and Food, Western Australia	Possibly. Cited in publications of environmental weeds, but no specifics are provided.

305	Congeneric weed	y
	Source(s)	Notes

Qsn #	Question	Answer
	CABI. 2015. <i>Clerodendrum chinense</i> . In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	" <i>C. chinense</i> is a highly invasive weed in tropical and subtropical ecosystems. This species has the capacity to move into a habitat and reproduce aggressively by root suckers. <i>C. chinense</i> is classified as a "major weed" in Hawaii, Fiji, Western Samoa, and American Samoa (PIER, 2012) where it grows commonly along roadsides and as an ornamental shrub in gardens. This species rapidly invades pastures and plantations wherever it is planted forming dense thickets that exclude other species (Space and Flynn, 2002; Motooka et al., 2003). In the West Indies, <i>C. chinense</i> is included in lists of invasive species in Cuba, Puerto Rico, and US Virgin Islands (Acevedo-Rodríguez and Strong, 2012; González et al., 2012) and is classified as a widespread exotic plant in the Lesser Antilles (including Antigua, Barbados, Dominica, Grenada, Guadeloupe, Martinique, Montserrat, St. Lucia, and St. Vincent; Broome et al., 2007)."
	CABI. 2015. <i>Clerodendrum quadriloculare</i> . In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	" <i>C. quadriloculare</i> is a highly invasive perennial shrub. This species produces large amounts of viable seed and can also grow rapidly by sprouts and root suckers. Seeds are mostly dispersed by birds and other animals. This species is listed as an invasive plant in Hawaii, American Samoa, Micronesia, Northern Mariana Islands, French Polynesia, Palau, and Western Samoa (PIER, 2012). On these islands, this species grows commonly along roadsides, waste grounds, disturbed areas, and is cultivated in yards and gardens (Space and Flynn, 2002). On Pohnpei (Micronesia), it was seen growing in full shade areas under the forest canopy in a dense monospecific understory (Space and Falanruw, 1999)."

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	[No evidence] "Shrubs 1–4 m tall. Branchlets 4-angled, pubescent to subglabrous, nodes sometimes villous. Petiole 0.5–15(–27) cm, densely yellow-brown pubescent; leaf blade subcordate, 8–35 × 6–27 cm, sparsely pubescent, abaxially densely covered with numerous peltate glands often covered with a sand-colored secretion, base cordate, margin sparsely serrulate to dentate, apex acuminate to acute."

402	Allelopathic	n
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	Unknown

403	Parasitic	n
	Source(s)	Notes
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Shrubs 1–4 m tall." [No evidence]

404	Unpalatable to grazing animals	n

Qsn #	Question	Answer
	Source(s)	Notes
	Swarbrick, J.T. 1997. Weeds of the Pacific Islands. Technical paper no. 209. South Pacific Commission, Noumea, New Caledonia	[Unknown. Other species presumably unpalatable] "Clerodendrum chinense" ... "Apparently unpalatable to stock"

405	Toxic to animals	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	"leaf used as vegetable" [Palatable to humans, with no evidence of toxicity]
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence

406	Host for recognized pests and pathogens	n
	Source(s)	Notes
	India Biodiversity Portal. 2015. Clerodendrum japonicum. http://indiabiodiversity.org/species/show/229210 . [Accessed 13 Aug 2015]	"Susceptible to insect pests."
	Hume, E.P. 1951. Some ornamental shrubs for the tropics. Circular No. 34. USDA Federal Experiment Station, Mayaguez, Puerto Rico	"They are somewhat bothered by scales and chewing insects."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Plants for a Future. 2015. Clerodendrum japonicum. http://www.pfaf.org/user/Plant.aspx?LatinName=Clerodendrum+japonicum . [Accessed 13 Aug 2015]	"Edible Uses: Flowers[177]. They are evil-smelling[177]. The leaves are also probably used[177]. Young leaves and shoots - cooked as a vegetable or pickled[272]." ... "The leaves are applied to boils[218]. A decoction of the inflorescence is used in the treatment of gonorrhoea, haematochezia and nosebleed[218]."
	Quattrocchi, U.. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"leaf used as vegetable" ... "Steamed leaves applied on forehead to check high blood pressure. Leaf juice alterative. Root paste applied on boils for suppuration. Veterinary medicine, plant juice given in case of diarrhea" [No evidence of toxicity]
	Deori, C., Roy, D.K., Talukdar, S.R., Pagag, K. & Sarma, N. 2013. Diversity of the genus Clerodendrum Linnaeus (Lamiaceae) in Northeast India with special reference to Barnadi Wildlife Sanctuary, Assam. Pleione 7(2): 473-488	[No evidence] "Clerodendrum japonicum ... Uses: Cultivated as an ornamental plant. Leaves are used as vegetable (Pal 1984)."
	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	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Rueda, R. M. (1993). The genus <i>Clerodendrum</i> (verbenaceae) in Mesoamerica. <i>Annals of the Missouri Botanical Garden</i> , 80(4): 870-890	[No evidence of increased fire risk] "In Mexico this species is found in secondary deciduous forest, in secondary middle elevation forest on rocky soil, and in coffee fields, at altitudes up to 1,300 m."

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	Notes
	Plants for a Future. 2015. <i>Clerodendrum japonicum</i> . http://www.pfaf.org/user/Plant.aspx?LatinName=Clerodendrum+japonicum . [Accessed 13 Aug 2015]	"It cannot grow in the shade."
	Mazza, G. 2015. <i>Clerodendrum japonicum</i> . http://www.photomazza.com/?Clerodendrum-japonicum . [Accessed 14 Aug 2015]	"It requires a position in full sun and sheltered from the winds and is not particular about the soil, provided well drained, maintained almost constantly humid."
	Almost Eden. 2015. <i>Clerodendrum japonicum</i> . Merryville, LA. http://almostedenplants.com/shopping/products/1048-Giant-Salvia-Japanese-Glorybower-Red-Glorybower-Clerodendrum-japonicum/ . [Accessed 13 Aug 2015]	[Partial shade] "The Giant Salvia or probably more correctly the Japanese Glory Bower is a great root hardy tropical for partially shaded sites." ... "Outdoor Light: Part sun, Part shade, Light shade "

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	
	Source(s)	Notes
	Almost Eden. 2015. <i>Clerodendrum japonicum</i> . Merryville, LA. http://almostedenplants.com/shopping/products/1048-Giant-Salvia-Japanese-Glorybower-Red-Glorybower-Clerodendrum-japonicum/ . [Accessed 13 Aug 2015]	"Soil pH Range: Acidic, Mildly Acidic, Neutral Soil Types & Moisture: Moist to average moist, well-drained soils."
	Dave's Garden. 2015. Japanese Glory Bower - <i>Clerodendrum japonicum</i> . http://davesgarden.com/guides/pf/go/201664/ . [Accessed 13 Aug 2015]	"Soil pH requirements: 5.6 to 6.0 (acidic) 6.1 to 6.5 (mildly acidic) 6.6 to 7.5 (neutral)"
	Plants for a Future. 2015. <i>Clerodendrum japonicum</i> . http://www.pfaf.org/user/Plant.aspx?LatinName=Clerodendrum+japonicum . [Accessed 13 Aug 2015]	"Succeeds in a sunny position in ordinary garden soil[1, 200] but prefers a fertile humus-rich well drained soil[164, 200]. The soil must not be allowed to dry out in the growing season[1]."

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Wu, Z. Y. & P. H. Raven, (eds). 1994. <i>Flora of China</i> . Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Shrubs 1–4 m tall. Branchlets 4-angled, pubescent to subglabrous, nodes sometimes villous. Petiole 0.5–15(–27) cm, densely yellow-brown pubescent; leaf blade subcordate, 8–35 × 6–27 cm, sparsely pubescent, abaxially densely covered with numerous peltate glands often covered with a sand-colored secretion, base cordate, margin sparsely serrulate to dentate, apex acuminate to acute."

412	Forms dense thickets	

Qsn #	Question	Answer
	Source(s)	Notes
	Mazza, G. 2015. <i>Clerodendrum japonicum</i> . http://www.photomazza.com/?Clerodendrum-japonicum . [Accessed 14 Aug 2015]	"...it grows in the thickets and along the banks of the water streams up to about 1500 m of altitude."
	Wu, Z. Y. & P. H. Raven, (eds). 1994. <i>Flora of China</i> . Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	[Unknown if species forms monocultures. May be a component of mixed thicket vegetation] "Thickets in valleys,"

501	Aquatic	n
	Source(s)	Notes
	Wu, Z. Y. & P. H. Raven, (eds). 1994. <i>Flora of China</i> . Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	[Terrestrial shrub] "Shrubs 1–4 m tall." ... "Thickets in valleys, along streams, in grassy openings; 100–1200 m."

502	Grass	n
	Source(s)	Notes
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed 11 Aug 2015]	"Family: Lamiaceae (alt. Labiatae) subfamily: Ajugoideae. Also placed in: Verbenaceae"

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed 11 Aug 2015]	[No evidence] "Family: Lamiaceae (alt. Labiatae) subfamily: Ajugoideae. Also placed in: Verbenaceae"

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Wu, Z. Y. & P. H. Raven, (eds). 1994. <i>Flora of China</i> . Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Shrubs 1–4 m tall. Branchlets 4-angled, pubescent to subglabrous, nodes sometimes villous. Petiole 0.5–15(–27) cm, densely yellow-brown pubescent; leaf blade subcordate, 8–35 × 6–27 cm, sparsely pubescent, abaxially densely covered with numerous peltate glands often covered with a sand-colored secretion, base cordate, margin sparsely serrulate to dentate, apex acuminate to acute."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes

Qsn #	Question	Answer
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	[No evidence. Widespread] "Thickets in valleys, along streams, in grassy openings; 100–1200 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangsu, S Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, S Zhejiang [Bangladesh, Bhutan, India, Indonesia, Laos, Malaysia, Vietnam]."

602	Produces viable seed	Y
	Source(s)	Notes
	van Valkenburg, J.L.C.H. & Bunyapraphatsara, N., 2001. <i>Clerodendrum</i> L.[Internet] Record from Proseabase. van Valkenburg, J.L.C.H. and Bunyapraphatsara, N. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org . [Accessed 13 Aug 2015]	"Propagation and planting <i>Clerodendrum</i> is propagated by seed, softwood and semi-ripe cuttings, root cuttings or simply by rooted suckers."
	Plants for a Future. 2015. <i>Clerodendrum japonicum</i> . http://www.pfaf.org/user/Plant.aspx?LatinName=Clerodendrum+japonicum . [Accessed 13 Aug 2015]	"Seed - best sown as soon as possible in a greenhouse. Germination can be erratic but usually takes place within 20 - 60 days at 20°C [164]."
	Hume, E.P. 1951. Some ornamental shrubs for the tropics. Circular No. 34. USDA Federal Experiment Station, Mayaguez, Puerto Rico	"Seeds are used for propagation."

603	Hybridizes naturally	
	Source(s)	Notes
	Rueda, R. M. (1993). The genus <i>Clerodendrum</i> (verbenaceae) in Mesoamerica. <i>Annals of the Missouri Botanical Garden</i> , 80(4): 870-890	"Many species seem to be closely related, with some hybridization reported. Some of the species are extremely variable, due to environmental factors and horticultural selection, which has led taxonomists to describe many taxa."

604	Self-compatible or apomictic	
	Source(s)	Notes
	India Biodiversity Portal. 2015. <i>Clerodendrum japonicum</i> . http://indiabiodiversity.org/species/show/229210 . [Accessed 13 Aug 2015]	[Unknown] " <i>Clerodendrum</i> species flowers are complete, bisexual, i.e., with functional male (androecium) and female (gynoecium), including stamens, carpels and ovary. Pollination is entomophilous i.e., by insects. Flowering/Fruiting: March-December."

605	Requires specialist pollinators	n
	Source(s)	Notes
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Inflorescences terminal thyrses, 15–34 × 13–35 cm; bracts and bractlets usually reddish. Calyx red, 1–1.5 cm, deeply 5-lobed, pubescent, outside sandy glandular; lobes ovate-lanceolate to ovate, 0.7–1.3 cm. Corolla white or red, tube 1.5–2.2 cm; lobes oblong, 1–1.5 cm. Stamens and style 3 × or more longer than corolla tube. Fruiting calyx much longer than fruit, becoming reflexed."

Qsn #	Question	Answer
	Rueda, R. M. (1993). The genus <i>Clerodendrum</i> (verbenaceae) in Mesoamerica. <i>Annals of the Missouri Botanical Garden</i> , 80(4): 870-890	"Pollination in <i>Clerodendrum</i> is mostly carried out by butterflies, moths, and bees, which extract the nectar from the base of the corolla tube. In most species the stamens and style project from the lower side of the horizontally oriented flower; pollen is carried off on the underside of the insect."

606	Reproduction by vegetative fragmentation	y
	Source(s)	Notes
	Plant Lust. 2015. <i>Clerodendrum japonicum</i> . http://plantlust.com/plants/clerodendrum-japonicum/ . [Accessed 13 Aug 2015]	"A tough old Heirloom that will slowly spread by underground runners finding its way to the perfect garden position."
	Almost Eden. 2015. <i>Clerodendrum japonicum</i> . Merryville, LA. http://almostedenplants.com/shopping/products/1048-Giant-Salvia-Japanese-Glorybower-Red-Glorybower-Clerodendrum-japonicum/ . [Accessed 13 Aug 2015]	"It does spread by rhizomes but it has never been aggressive. The new pups are well-spaced out and so they don't crowd out other plants like the notorious Cashmere Bouquet can."

607	Minimum generative time (years)	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	Time to maturity unknown, but may be able to sucker & reproduce vegetatively prior to first production of viable seeds

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	van Valkenburg, J.L.C.H. & Bunyaphatsara, N., 2001. <i>Clerodendrum</i> L.[Internet] Record from Proseabase. van Valkenburg, J.L.C.H. and Bunyaphatsara, N. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org . [Accessed 14 Aug 2015]	[Bird-dispersed. Fruit & seeds lack means of external attachment] "The fruits are eaten by birds, which disperse the seeds. In many species the calyx provides a contrasting colour. The pseudo-aril present in some species is actually a placental part of the pericarp that acts as an attractant to birds in the fruit dispersal process."

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Almost Eden. 2015. <i>Clerodendrum japonicum</i> . Merryville, LA. http://almostedenplants.com/shopping/products/1048-Giant-Salvia-Japanese-Glorybower-Red-Glorybower-Clerodendrum-japonicum/ . [Accessed 14 Aug 2015]	"Massive spikes of crimson blooms, to 24" high and 16" wide, are held above the large, tropical, heart-shaped leaves. Blooms throughout summer and into fall." [Sold commercially]

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes

Qsn #	Question	Answer
	van Valkenburg, J.L.C.H. & Bunyapraphatsara, N., 2001. <i>Clerodendrum</i> L.[Internet] Record from Proseabase. van Valkenburg, J.L.C.H. and Bunyapraphatsara, N. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org . [Accessed 14 Aug 2015]	[Unlikely] "The fruits are eaten by birds, which disperse the seeds. In many species the calyx provides a contrasting colour. The pseudo-aril present in some species is actually a placental part of the pericarp that acts as an attractant to birds in the fruit dispersal process."

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	No evidence. [Fleshy-fruited] "Fruiting calyx much longer than fruit, becoming reflexed. Drupes green when young, blue-black at maturity, subglobose, 7–10 mm in diam."

705	Propagules water dispersed	
	Source(s)	Notes
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Thickets in valleys, along streams, in grassy openings; 100–1200 m." [Unknown. Distribution along streams may allow for secondary dispersal of seeds by water]

706	Propagules bird dispersed	y
	Source(s)	Notes
	Rueda, R. M. (1993). The genus <i>Clerodendrum</i> (verbenaceae) in Mesoamerica. <i>Annals of the Missouri Botanical Garden</i> , 80(4): 870-890	"The fruits of <i>Clerodendrum</i> species are eaten by birds, which disperse the seeds (Moldenke, 1985)."
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	[Presumably Yes. Fleshy-fruited] "Fruiting calyx much longer than fruit, becoming reflexed. Drupes green when young, blue-black at maturity, subglobose, 7–10 mm in diam."

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	van Valkenburg, J.L.C.H. & Bunyapraphatsara, N., 2001. <i>Clerodendrum</i> L.[Internet] Record from Proseabase. van Valkenburg, J.L.C.H. and Bunyapraphatsara, N. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org . [Accessed 14 Aug 2015]	[No evidence. Fruits & seeds lack means of external attachment] "The fruits are eaten by birds, which disperse the seeds. In many species the calyx provides a contrasting colour. The pseudo-aril present in some species is actually a placental part of the pericarp that acts as an attractant to birds in the fruit dispersal process."

708	Propagules survive passage through the gut	y
	Source(s)	Notes
	Rueda, R. M. (1993). The genus <i>Clerodendrum</i> (verbenaceae) in Mesoamerica. <i>Annals of the Missouri Botanical Garden</i> , 80(4): 870-890	[Presumably Yes] "The fruits of <i>Clerodendrum</i> species are eaten by birds, which disperse the seeds (Moldenke, 1985)."

801	Prolific seed production (>1000/m2)	

Qsn #	Question	Answer
	Source(s)	Notes
	Mazza, G. 2015. <i>Clerodendrum japonicum</i> . http://www.photomazza.com/?Clerodendrum-japonicum . [Accessed 14 Aug 2015]	[Unlikely. Densities unknown] "The fruits are globose drupes with 4 lodges, of about 1 cm of diameter, blackish blue when ripe, with the lobes of the calyx persistent, containing 4 seeds (one per each lodge)."

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	Unknown
	Royal Botanic Gardens Kew. 2008. Seed Information Database (SID). Version 7.1. http://data.kew.org/sid/ . [Accessed 14 Aug 2015]	Unknown for <i>Clerodendrum japonicum</i> . Other species have orthodox seeds

803	Well controlled by herbicides	y
	Source(s)	Notes
	Swarbrick, J.T. 1997. Weeds of the Pacific Islands. Technical paper no. 209. South Pacific Commission, Noumea, New Caledonia	[Control methods for <i>C. chinense</i> would likely be effective on <i>C. japonicum</i>] "Probably susceptible to: 1) foliar application of arboricides such as picloram, metsulfuron methyl, glyphosate and triclopyr at standard rates and dilutions; 2) cut-stump application of the same herbicides; 3) soil application of hexazinone, karbutilate, fluroxypyr and bromacil at standard rates"
	Englberger, K. 2009. Invasive weeds of Pohnpei: A guide for identification and public awareness. Conservation Society of Pohnpei, Kolonia, FM	[Control methods for <i>C. chinense</i> would likely be effective on <i>C. japonicum</i>] "Young plants can be sprayed by a herbicide such as triclopyr (Garlon 4). Undiluted herbicide can be applied to the cut stems of larger plants with woody stems"
	Motooka, P., Castro, L., Nelson, D., Nagai, G. & Ching, L. 2003. Weeds of Hawaii's Pastures and Natural Areas: An Identification and Management Guide. CTAHR, UH Manoa, Honolulu, HI	[Control methods for <i>C. chinense</i> would likely prove effective on <i>C. japonicum</i>] "A little work done suggests hormone-type herbicides in timely repeat applications will control this weed"
	Waterhouse, D.F. 1993. Biological control: Pacific prospects. Supplement 2. Australian Centre for International Agricultural Research, Canberra, Australia	[Herbicides provide effective control for <i>C. chinense</i> . Likely would be effective on <i>C. japonicum</i>] "No detailed screening of herbicides has been carried out, although 2,4,5-T, or the more expensive Tordon 520 Brushkiller, are suggested as possible herbicides for Western Samoa. More recently a mixture of dicamba and 2,4-D has proved effective. Work carried out in Western Samoa has also shown that metsulfuron methyl ester produces effective control. It has been recommended that the plants be cut and the new growth sprayed. When herbicides were applied in Western Samoa to regrowth four weeks after it had been slashed to the ground, glyphosate partially destroyed the foliage, but complete regrowth had occurred by 4 to 6 weeks after application. Treatment with 2,4,5-T resulted in complete kill of foliage, but 5 to 15% of the plants had regrown after 8 weeks"

Qsn #	Question	Answer
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	Notes
	Hume, E.P. 1951. Some ornamental shrubs for the tropics. Circular No. 34. USDA Federal Experiment Station, Mayaguez, Puerto Rico	[Tolerates cutting to ground] "The plants become straggly with age and should be cut nearly to the ground after the fruits mature."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits

- Elevation range exceeds 1000 m, demonstrating environmental versatility
- Thrives in tropical climates
- Naturalized in Bhutan, Mexico, Guyana; Suriname, Brazil, & possibly Georgia and Florida
- Possibly weedy & invasive
- Other *Clerodendrum* species have become invasive
- Reproduces by seeds & vegetatively by suckers
- Seeds dispersed by birds & intentionally by people
- Able to resprout after cutting to base
- Limited biological & ecological information may reduce accuracy of risk prediction

Low Risk Traits

- Unarmed (no spines, thorns or burrs)
- Not reported to be toxic
- Ornamental
- May only tolerate partial shade, or thrive in full sun (may limit ability to invade intact forest)