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Assessment date 11 February 2016

	Thunbergia grandiflora 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)	У	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	У	1
2.05	Does the species have a history of repeated introductions outside its natural range?	У	
3.01	Naturalized beyond native range	У	2
3.02	Garden/amenity/disturbance weed	У	2
3.03	Weed of agriculture	unk	
3.04	Environmental weed	у	4
3.05	Congeneric weed	У	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	unk	-1
4.05	Toxic to animals	n	0
4.06	Host for recognised pests and pathogens	n	0
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	n	0
4.10	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils). North &	unk	
	Central Zones: infertile soils; South Zone: shallow limerock or Histisols.		0
4.11	Climbing or smothering growth habit	у	1
4.12	Forms dense thickets	У	1
5.01	Aquatic	n	0
5.02	Grass	n	0
5.03	Nitrogen fixing woody plant	n	0
5.04	Geophyte	у	1
6.01	Evidence of substantial reproductive failure in native habitat	n	0
6.02	Produces viable seed	у	1

6.03	Hybridizes naturally	unk	-1
6.04	Self-compatible or apomictic		-1
6.05	Requires specialist pollinators		
6.06	Reproduction by vegetative propagation y		1
6.07	Minimum generative time (years)	unk	-1
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked	У	
	areas)		1
7.02	Propagules dispersed intentionally by people	У	1
7.03	Propagules likely to disperse as a produce contaminant	unk	-1
7.04	Propagules adapted to wind dispersal	unk	-1
7.05	Propagules water dispersed	У	1
7.06	Propagules bird dispersed	unk	-1
7.07	Propagules dispersed by other animals (externally)	n	-1
7.08	Propagules dispersed by other animals (externally)		-1
8.01	Prolific seed production	n	-1
8.02	Evidence that a persistent propagule bank is formed (>1 yr)	unk	-1
8.03	Well controlled by herbicides	У	-1
8.04	Tolerates, or benefits from, mutilation or cultivation	У	1
8.05		?	
	Total Score	9	
	Implemented Pacific Second Screening	na	<u></u>
	Risk Assessment Results	Hig	gh

section		satisfy
	# questions answered	minimum?
А		10 yes
В		8 yes
В С		15 yes
total		33 yes

	Reference	Source data
1.01		cultivated, but no evidence of selection for reduced weediness
1.02		skip to question 2.01
1.03		skip to question 2.01
2.01	1. PERAL NAPPFAST Global Plant Hardiness (http://www.nappfast.org/Plant_hardiness/NAPPFAST%20Global %20zones/10- year%20climate/PLANT_HARDINESS_10YR%20lgnd.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 (12- 15-2015).	1/one 10a· to -1.1.*( (30 °E) UNDA /one 10b· to 1.7.*( (35 °E)
2.02	1. Köppen-Geiger climate map (http://www.hydrol-earth-syst sci.net/11/1633/2007/hess-11-1633-2007.pdf). 2. GBIF Secretariat: GBIF Backbone Taxonomy, 2013-07-01. Accessed via http://www.gbif.org/species/5415456 on 2015- 12-15	1. Distribution in the native/cultivated range occurs in Cwa, Cfa, Aw, Am, Af
2.04	1. Climate Charts. World Climate Maps. http://www.climate- charts.com/World-Climate-Maps.html#rain (8-19-2015)	1. Native to regions with annual rainfall from 28 inches to 197 inches.
2.05	1. Invasive Species Compendium http://www.cabi.org/isc/datasheet/117524 (12-15-2015) [Julissa Rojas-Sandoval, Department of Botany-Smithsonian NMNH, Washington DC, USA, Pedro Acevedo-Rodríguez, Department of Botany-Smithsonian NMNH, Washington DC, USA] 2. Wildlife of Hawaii http://wildlifeofhawaii.com/flowers/422/thunbergia- grandiflora-bengal-trumpet/ (12-16-2015) 3. PIER http://www.hear.org/pier/species/thunbergia_grandiflora.htm (12- 16-2015)	1. This species has been repeatedly introduced as an ornamental plant in many countries around the world 2. Introduced to Hawaii 3. Introduced across the pacific and to Australia.
3.01	1. Agnes Lusweti, National Museums of Kenya; Emily Wabuyele, National Museums of Kenya, Paul Ssegawa, Makerere University; John Mauremootoo, BioNET-INTERNATIONAL Secretariat - UK. http://keys.lucidcentral.org/keys/v3/eafrinet/weeds/key/weeds/Me dia/Html/Thunbergia_grandiflora_(Blue_Thunbergia).htm (12-15- 2015) 2. Invasive Species Compendium http://www.cabi.org/isc/datasheet/117524 (12-15-2015) [Julissa Rojas-Sandoval, Department of Botany-Smithsonian NMNH, Washington DC, USA, Pedro Acevedo-Rodríguez, Department of Botany-Smithsonian NMNH, Washington DC, USA]	1. Locations within which Thunbergia grandiflora is naturalised include tropical Australia, tropical South America, Central America, south-eastern USA and some oceanic islands with warm climates. 2. T. grandiflora is native to India, parts of China and south Asia, but widely cultivated and naturalized in tropical and subtropical regions.
3.02	1. Queensland Government Queenshttp://keyserver.lucidcentral.org/weeds/data/080c0106- 040c-4508-8300- 0b0a06060e01/media/html/Thunbergia_grandiflora.htm (12-15- 2015) 2. Invasive Species Compendium http://www.cabi.org/isc/datasheet/117524 (12-15-2015) [Julissa Rojas-Sandoval, Department of Botany-Smithsonian NMNH, Washington DC, USA, Pedro Acevedo-Rodríguez, Department of Botany-Smithsonian NMNH, Washington DC, USA] 3. Department of Agriculture, Fisheries and Forestry Biosecurity Queensland Fact sheet DECLARED CLASS 1 AND 2 PEST PLANT PP23 PP23 September 2007 https://www.moretonbay.qld.gov.au/uploadedFiles/moretonbay/en vironment/vegetation/thunbergia.pdf (12-15-2015)	<ol> <li>A weed of watercourses (i.e. riparian areas), disturbed closed forests, forest margins, open woodlands, roadsides, fence-lines, gardens and plantation crops in tropical and sub-tropical regions.</li> <li>It is especially common in disturbed areas, urban forests near human settlements, riparian forests, forest gaps, forest edges and along roadsides intentionally planted as an ornamental and it has escaped from gardens and spread rapidly into natural forests 3. In garden situations it will also quickly spread, and the large tubers may cause damage to paths, fences and foundations.</li> </ol>

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3.03	1. Queensland Government Queenshttp://keyserver.lucidcentral.org/weeds/data/080c0106- 040c-4508-8300- 0b0a06060e01/media/html/Thunbergia_grandiflora.htm (12-15- 2015)	A weed of watercourses (i.e. riparian areas), disturbed closed forests, forest margins, open woodlands, roadsides, fence-lines, gardens and plantation crops in tropical and sub-tropical regions.
3.04	1. Queensland Government Queenshttp://keyserver.lucidcentral.org/weeds/data/080c0106- 040c-4508-8300- 0b0a06060e01/media/html/Thunbergia_grandiflora.htm (12-15- 2015) 2. Invasive Species Compendium http://www.cabi.org/isc/datasheet/117524 (12-15-2015) [Julissa Rojas-Sandoval, Department of Botany-Smithsonian NMNH, Washington DC, USA, Pedro Acevedo-Rodríguez, Department of Botany-Smithsonian NMNH, Washington DC, USA] 3. Department of Agriculture, Fisheries and Forestry Biosecurity Queensland Fact sheet DECLARED CLASS 1 AND 2 PEST PLANT PP23 PP23 September 2007 https://www.moretonbay.qld.gov.au/uploadedFiles/moretonbay/en vironment/vegetation/thunbergia.pdf (12-15-2015)	1. Blue thunbergia (Thunbergia grandiflora) is regarded as a significant environmental weed in Queensland, and as a potential environmental weed or "sleeper weed" in the Northern Territory and New South Wales. 2. Once established, T. grandiflora completely smothers native vegetation by killing host-trees, out-competing understory plants, and negatively affecting the germination and establishment of seedlings of native species T. grandiflora has an extensive tuberous root system, which can weigh up to 70 kg and can damage river banks, paths, fences and building foundations. This fast-growing vine forms dense colonies that engulf native vegetation in the understory of native forests. 3. The plant climbs and blankets native vegetation often pulling down mature trees with the weight of the vine. Smothered vegetation also has dramatically reduced light levels to lower layers of vegetation of the pest difficult.
3.05	1. CRC for Australian Weed Management and the Commonwealth Department of the Environment and Heritage https://www.environment.gov.au/biodiversity/invasive/weeds/publi cations/guidelines/alert/pubs/t-laurifolia.pdf (12-15-2015)	1. Thunbergia species are a major threat to remnant vegetation in the Wet Tropics. T. laurifolia is a vigorous, perennial, climbing vine. It is not as widespread as the closely related blue trumpet vine T. grandiflora, and infestations can be eradicated before they become uncontrollable. Prevention is the most cost- effective form of weed control. Keep uninfested areas free of Thunbergia species. In Queensland T. laurifolia is a declared weed and landholders are required to control it.
4.01	1. Flora of China http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=2423 52257 (12-15-2015)	
4.02		no evidence
4.03		no eivdence
4.04		no evidence
4.05		no evidence
4.06	1. Missouri Botanical Garden http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderD etails.aspx?kempercode=c941 (12-15-2015)	
4.07		no evidence
4.08		no evidence
4.09	2015) 3. Invasive Species Compendium http://www.cabi.org/isc/datasheet/117524 (12-15-2015) [Julissa Rojas-Sandoval, Department of Botany-Smithsonian NMNH, Washington DC, USA, Pedro Acevedo-Rodríguez, Department of Botany-Smithsonian NMNH, Washington DC, USA]	1. Sun: Full sun to part shade 2. Full sun 3. This species does not tolerate shaded conditions and climbs over trees and shrubs looking for sunny areas in the canopy of the forests.
4.10	1. USDA Global Soil Regions http://www.nrcs.usda.gov/Internet/FSE_MEDIA/nrcs142p2_05072 2.jpg (12-16-2015)	There is a degree of overlap between the soil regions of this plant's native area and parts of Florida. Other soil data is insufficient to answer this questions.

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4.11	1. Agnes Lusweti, National Museums of Kenya; Emily Wabuyele, National Museums of Kenya, Paul Ssegawa, Makerere University; John Mauremootoo, BioNET-INTERNATIONAL Secretariat - UK. http://keys.lucidcentral.org/keys/v3/eafrinet/weeds/key/weeds/Me dia/Html/Thunbergia_grandiflora_(Blue_Thunbergia).htm (12-15- 2015) 2. Invasive Species Compendium http://www.cabi.org/isc/datasheet/117524 (12-15-2015) [Julissa Rojas-Sandoval, Department of Botany-Smithsonian NMNH, Washington DC, USA, Pedro Acevedo-Rodríguez, Department of Botany-Smithsonian NMNH, Washington DC, USA]	1. It is a vigorous climber and can smother vegetation up to 12 metres above ground, reducing light levels for lower vegetation. 2. Vine / climber
4.12	1. Invasive Species Compendium http://www.cabi.org/isc/datasheet/117524 (12-15-2015) [Julissa Rojas-Sandoval, Department of Botany-Smithsonian NMNH, Washington DC, USA, Pedro Acevedo-Rodríguez, Department of Botany-Smithsonian NMNH, Washington DC, USA]	forming dense monoculture stands
5.01		Family: Acanthaceae
5.02		Family: Acanthaceae
5.03		no evidence, vine; Acanthaceae
5.04	1. Flora of China http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=2423 52257 (12-15-2015)	Vine with tuber
6.01		no evidence
6.02	1. Queensland Government Queenshttp://keyserver.lucidcentral.org/weeds/data/080c0106- 040c-4508-8300- 0b0a06060e01/media/html/Thunbergia_grandiflora.htm (12-15- 2015) 2. Agnes Lusweti, National Museums of Kenya; Emily Wabuyele, National Museums of Kenya, Paul Ssegawa, Makerere University; John Mauremootoo, BioNET- INTERNATIONAL Secretariat - UK. http://keys.lucidcentral.org/keys/v3/eafrinet/weeds/key/weeds/Me dia/Html/Thunbergia_grandiflora_(Blue_Thunbergia).htm (12-15- 2015) 3. Royal Horticultural Society https://www.rhs.org.uk/plants/details?plantid=3505 (12-15-2015)	1. This species reproduces via seed (but fruit are only produced in warmer climates) and is also capable of regenerating from stem fragments or portions of the tuberous roots. 2. Reproduces via seed. 3. Propagated by seed
6.03		no evidence
6.04	1. Invasive Species Compendium http://www.cabi.org/isc/datasheet/117524 (12-15-2015) [Julissa Rojas-Sandoval, Department of Botany-Smithsonian NMNH, Washington DC, USA, Pedro Acevedo-Rodríguez, Department of Botany-Smithsonian NMNH, Washington DC, USA] 2. Young, A. M. (1983) Nectar and pollen robbing of Thunbergia grandiflora by Trigona bees in Costa Rica. Biotropica, 1983, Vol. 15, No. 1, pp. 78-80 3. Learn 2 Grow http://www.learn2grow.com/plants/thunbergia-grandiflora/ (12-15- 2015)	<ol> <li>For species in the genus Thunbergia, flowers are bisexual, zygomorphic, axillary, usually solitary, with long pedicels and a pair of foliaceous bracts covering the lower portion of the corolla</li> <li>failed to set seed, possibly because the vines were descended from a single self-incompatible variety 3. Not self sowing</li> </ol>
6.05	<ol> <li>Invasive Species Compendium http://www.cabi.org/isc/datasheet/117524 (12-15-2015) [Julissa Rojas-Sandoval, Department of Botany-Smithsonian NMNH, Washington DC, USA, Pedro Acevedo-Rodríguez, Department of Botany-Smithsonian NMNH, Washington DC, USA] 2. Fiala, B., S. A. Krebs, H. S. Barlow, and U. Maschwitz. 1996. Interactions between the climber Thunbergia grandiflora, its pollinator Xylocopa latipes and Dolichoderus thoracicus: The "nectar-thief hypothesis" refuted?. Malayan Nature Journal 50 3. J.Y. Meyer, C. Lavergne Beautés fatales: Acanthaceae species as invasive alien plants on tropical Indo-Pacific Islands Diversity and Distributions, 10 (2004) 4. Young, A. M. (1983) Nectar and pollen robbing of Thunbergia grandiflora by Trigona bees in Costa Rica. Biotropica, 1983, Vol. 15, No. 1, pp. 78-80</li> </ol>	both of two types of damage: anthers chewed apart and/or the bulbous area behind the constriction of the corolla with a hole chewed through it to expose the nectar cavity. Almost 100% of all

8.02		no evidence
8.01	1. Department of Agriculture, Fisheries and Forestry Biosecurity Queensland Fact sheet DECLARED CLASS 1 AND 2 PEST PLANT PP23 PP23 September 2007 https://www.moretonbay.qld.gov.au/uploadedFiles/moretonbay/en vironment/vegetation/thunbergia.pdf (12-15-2015)	from cultivated plants]
7.08		no evidence
	1. Flora of China http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=2423 52257 (12-15-2015)	
7.06		no evidence
	http://keys.lucidcentral.org/keys/v3/eafrinet/weeds/key/weeds/Me dia/Html/Thunbergia_grandiflora_(Blue_Thunbergia).htm (12-15- 2015) 3. Invasive Species Compendium http://www.cabi.org/isc/datasheet/117524 (12-15-2015) [Julissa Rojas-Sandoval, Department of Botany-Smithsonian NMNH, Washington DC, USA, Pedro Acevedo-Rodríguez, Department of Botany-Smithsonian NMNH, Washington DC, USA]	they can also be dispersed by rivers, streams and on waterways after rain storms
7.05	1. Queensland Government Queenshttp://keyserver.lucidcentral.org/weeds/data/080c0106- 040c-4508-8300- 0b0a06060e01/media/html/Thunbergia_grandiflora.htm (12-15- 2015) 2. Agnes Lusweti, National Museums of Kenya; Emily Wabuyele, National Museums of Kenya, Paul Ssegawa, Makerere University; John Mauremootoo, BioNET- INTERNATIONAL Secretariat - UK.	<ol> <li>The tuberous roots may also be spread during soil moving activities (e.g. roadworks) and by flood waters.</li> <li>Dispersal of the disseminules may be by stem and tuber pieces carried by water</li> <li>Seeds are catapulted several metres when ripe pods open and</li> </ol>
7.04		no evidence
7.03		no evidence
7.02	1. Queensland Government Queenshttp://keyserver.lucidcentral.org/weeds/data/080c0106- 040c-4508-8300- 0b0a06060e01/media/html/Thunbergia_grandiflora.htm (12-15- 2015) 2. Invasive Species Compendium http://www.cabi.org/isc/datasheet/117524 (12-15-2015) [Julissa Rojas-Sandoval, Department of Botany-Smithsonian NMNH, Washington DC, USA, Pedro Acevedo-Rodríguez, Department of Botany-Smithsonian NMNH, Washington DC, USA]	1. It has been widely cultivated as an ornamental and is most commonly dispersed in dumped garden waste. 2. This species has been repeatedly introduced as an ornamental plant in many countries around the world, but it has become a serious environmental problem when it has escaped from cultivated areas and rapidly colonized natural habitats
7.01	1. Queensland Government Queenshttp://keyserver.lucidcentral.org/weeds/data/080c0106- 040c-4508-8300- 0b0a06060e01/media/html/Thunbergia_grandiflora.htm (12-15- 2015) 2. Invasive Species Compendium http://www.cabi.org/isc/datasheet/117524 (12-15-2015) [Julissa Rojas-Sandoval, Department of Botany-Smithsonian NMNH, Washington DC, USA, Pedro Acevedo-Rodríguez, Department of Botany-Smithsonian NMNH, Washington DC, USA]	1. It has been widely cultivated as an ornamental and is most commonly dispersed in dumped garden waste. The tuberous roots may also be spread during soil moving activities (e.g. roadworks) and by flood waters. 2. It is especially common in disturbed areas, urban forests near human settlements, riparian forests, forest gaps, forest edges and along roadsides In Hawaii, T. grandiflora grows in lowland moist areas, disturbed forests, and urban areas
6.07		no evidence
6.06	1. Queensland Government Queenshttp://keyserver.lucidcentral.org/weeds/data/080c0106- 040c-4508-8300- 0b0a06060e01/media/html/Thunbergia_grandiflora.htm (12-15- 2015) 2. Agnes Lusweti, National Museums of Kenya; Emily Wabuyele, National Museums of Kenya, Paul Ssegawa, Makerere University; John Mauremootoo, BioNET- INTERNATIONAL Secretariat - UK. http://keys.lucidcentral.org/keys/v3/eafrinet/weeds/key/weeds/Me dia/Html/Thunbergia_grandiflora_(Blue_Thunbergia).htm (12-15- 2015) 3. Invasive Species Compendium http://www.cabi.org/isc/datasheet/117524 (12-15-2015) [Julissa Rojas-Sandoval, Department of Botany-Smithsonian NMNH, Washington DC, USA, Pedro Acevedo-Rodríguez, Department of Botany-Smithsonian NMNH, Washington DC, USA]	1. This species reproduces via seed (but fruit are only produced in warmer climates) and is also capable of regenerating from stem fragments or portions of the tuberous roots. 2. T. grandiflora is also capable of regenerating from stem fragments or portions of the tuberous roots and vegetatively by stolons. 3. T. grandiflora reproduces sexually by seeds and vegetatively by stem fragments, tubers, and roots
6.65	1. Overeneland Ocurrent	

8.03	1. Agnes Lusweti, National Museums of Kenya; Emily Wabuyele, National Museums of Kenya, Paul Ssegawa, Makerere University; John Mauremootoo, BioNET-INTERNATIONAL Secretariat - UK. http://keys.lucidcentral.org/keys/v3/eafrinet/weeds/key/weeds/Me dia/Html/Thunbergia grandiflora (Blue Thunbergia).htm (12-15-	Spraying or painting cut stumps with herbicides such as glyphosate is an effective control method. 2. Imazapyr is very effective in killing thunbergia, and does not drastically affect
	2015) 2. 2. Invasive Species Compendium http://www.cabi.org/isc/datasheet/117524 (12-15-2015) [Julissa Rojas-Sandoval, Department of Botany-Smithsonian NMNH, Washington DC, USA, Pedro Acevedo-Rodríguez, Department of Botany-Smithsonian NMNH, Washington DC, USA]	surrounding vegetation 3. The root system, when cut, persistently sprouts from its many dormant buds.
	1. Agnes Lusweti, National Museums of Kenya; Emily Wabuyele, National Museums of Kenya, Paul Ssegawa, Makerere University; John Mauremootoo, BioNET-INTERNATIONAL Secretariat - UK. http://keys.lucidcentral.org/keys/v3/eafrinet/weeds/key/weeds/Me dia/Html/Thunbergia_grandiflora_(Blue_Thunbergia).htm (12-15-	1. The root system persistently sprouts from its many buds when cut back or pruned. 3. The root system, when cut, persistently sprouts from its many dormant buds.
8.05		no evidence