

Assessment date 9 August 2016

<i>Merremia tuberosa</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	y	2
3.03	Weed of agriculture	n	0
3.04	Environmental weed	y	4
3.05	Congeneric weed	n	0
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic	n	0
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals	y	1
4.05	Toxic to animals	y	1
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	unk	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	y	1
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	y	1
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)	unk	-1
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y	1
7.02	Propagules dispersed intentionally by people	y	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	y	1
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)	n	-1
8.01	Prolific seed production	unk	-1
8.02	Evidence that a persistent propagule bank is formed (>1 yr)	y	1
8.03	Well controlled by herbicides	y	-1
8.04	Tolerates, or benefits from, mutilation or cultivation	unk	-1
8.05	Effective natural enemies present in U.S.	?	
Total Score			10
Implemented Pacific Second Screening			no
Risk Assessment Results			high

section	# questions answered	satisfy minimum?
A		11 yes
B		9 yes
C		16 yes
total		36 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%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 (4-27-2016).	No computer analysis was performed. 1. Global hardiness zone: 9, 10, 11, 12, 13; 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 Zone 12a: to (50 °F) USDA Zone 12b: to (55 °F). . 2. Native to Mexico and Central America
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/113658435 (4-27-2016)	1. Distribution in the native/cultivated range occurs in Af, Aw, Am, BSh, BSk
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 rainfall from 19 inches to 196 inches precipitation annually
2.05	1. Global Invasive Species Database (2016) Species profile: <i>Merremia tuberosa</i> . Downloaded from http://www.iucngisd.org/gisd/species.php?sc=1279 on 27-04-2016. 2. Invasive Species Compendium http://www.cabi.org/isc/datasheet/115577 (4-27-2016)	<i>Merremia tuberosa</i> was spread through as a medicine throughout Europe when it was discovered in Mexico, and subsequently through horticulture trade around the world. The roots contain resins that formerly were used across the tropics and in Europe as laxatives. Now it is grown and introduced for their flowers and ornamental fruits that are used by florists 2. By the early 1800s, <i>M. tuberosa</i> was introduced into Africa, Mauritius, Hong Kong, the Philippines, Ethiopia, and Australia and in 1897 Hallier recorded the first specimens of <i>M. tuberosa</i> from Brazil
3.01	1. Invasive Species Compendium http://www.cabi.org/isc/datasheet/115577 (4-27-2016) 2. Wagner. 1999. Flowering Plants of Hawaii. Volume 1. 563-564	1. Now it can be found naturalized and cultivated throughout tropical Africa, South America, the Caribbean, the Mascarene Islands, China, India, Indonesia, Sri Lanka, Australia and on islands in the Pacific 2. Naturalized on disturbed sites on Kaua'i, O'ahu, Maui, and Hawaii
3.02	1. Invasive Species Compendium http://www.cabi.org/isc/datasheet/115577 (4-27-2016)	1. In addition it behaves as a weed in open and disturbed habitats.
3.03		no evidence
3.04	1. Global Invasive Species Database (2016) Species profile: <i>Merremia tuberosa</i> . Downloaded from http://www.iucngisd.org/gisd/species.php?sc=1279 on 27-04-2016. 2. Invasive Species Compendium http://www.cabi.org/isc/datasheet/115577 (4-27-2016) 3. University of Hawaii http://www.botany.hawaii.edu/faculty/cw_smith/mer_tub.htm (4-28-2016)	1. <i>Merremia tuberosa</i> is known to overgrow and smother tall hardwood forest canopies. This perennial vine blocks sunlight from trees and the understory, killing native trees and shrubs. 2. <i>M. tuberosa</i> is a woody, vigorous vine that overgrows and smothers tall forest canopies. It blocks sunlight from trees and the understory, killing native trees and shrubs in the forest understory. It has been especially problematic on islands such as Cuba, St Lucia, Hawaii, and Niue where it has spread quickly and aggressively 3. This light-loving, perennial vine can smother tall forest canopies.
3.05	1. Holm et al. A Geographic Atlas of World Weeds	1. <i>Merremia unbellata</i> is a common weed of Trinidad
4.01	1. Wagner. 1999. Flowering Plants of Hawaii. Volume 1. 563-564	1. No evidence of these features
4.02		no evidence
4.03	1. Wagner. 1999. Flowering Plants of Hawaii. Volume 1. 563-564	1. No evidence of these features

4.04	1. Global Invasive Species Database (2016) Species profile: <i>Merremia tuberosa</i> . Downloaded from http://www.iucngisd.org/gisd/species.php?sc=1279 on 27-04-2016. 2. Invasive Species Compendium http://www.cabi.org/isc/datasheet/115577 (4-27-2016)	1. It is also reported to be toxic to animals and humans and should not be ingested by either 2. Toxic to animals
4.05	1. Global Invasive Species Database (2016) Species profile: <i>Merremia tuberosa</i> . Downloaded from http://www.iucngisd.org/gisd/species.php?sc=1279 on 27-04-2016. 2. Invasive Species Compendium http://www.cabi.org/isc/datasheet/115577 (4-27-2016)	1. It is also reported to be toxic to animals and humans and should not be ingested by either 2. Toxic to animals
4.06		no evidence
4.07	1. Global Invasive Species Database (2016) Species profile: <i>Merremia tuberosa</i> . Downloaded from http://www.iucngisd.org/gisd/species.php?sc=1279 on 27-04-2016. 2. Dave's Garden http://davesgarden.com/guides/pf/go/53475/#b (2-27-2016)	1. It is also reported to be toxic to animals and humans and should not be ingested by either 2. Seed is poisonous if ingested
4.08		no evidence
4.09	1. Whistler, W.A. 2000. Tropical Ornamentals. Timber Press, Portland 2. PIER http://www.hear.org/pier/species/merremia_tuberosa.htm (4-2-2016)	1. Sunny places are preferred 2. Light-loving
4.10	1. Invasive Species Compendium http://www.cabi.org/isc/datasheet/115577 (4-27-2016)	1. <i>M. tuberosa</i> grows best on sandy well-drained soils bn [Lack of evidence to report on zone affinity]
4.11	1. PIER http://www.hear.org/pier/species/merremia_tuberosa.htm (4-2-2016) 2. Invasive Species Compendium http://www.cabi.org/isc/datasheet/115577 (4-27-2016)	1. Climber 2. It is a climbing vine that grows over trees or other surfaces and prefers high levels of sunlight
4.12		no evidence
5.01		Family: Convolvulaceae
5.02		Family: Convolvulaceae
5.03	1. Wagner. 1999. Flowering Plants of Hawaii. Volume 1. 563-564	1. Herbaceous
5.04	1. University of Hawaii http://www.botany.hawaii.edu/faculty/cw_smith/mer_tub.htm (4-28-2016)	1. The aerial portion of the plant is killed by fire, but a new vine is soon produced from its underground tuber.
6.01		no evidence
6.02	1. Global Invasive Species Database (2016) Species profile: <i>Merremia tuberosa</i> . Downloaded from http://www.iucngisd.org/gisd/species.php?sc=1279 on 27-04-2016. 2. Dave's Garden http://davesgarden.com/guides/pf/go/53475/#b (2-27-2016) 3. Invasive Species Compendium http://www.cabi.org/isc/datasheet/115577 (4-27-2016)	1. <i>Merremia tuberosa</i> reproduces primarily through seed production and also by vegetative fragmentation. 2. propagated by seed 3. is a fast-growing vine with the capability to reproduce sexually by seeds and vegetatively from discarded cuttings
6.03		no evidence
6.04		no evidence
6.05	1. Invasive Species Compendium http://www.cabi.org/isc/datasheet/115577 (4-27-2016)	1. pollinated by insects. Bees, butterflies and birds have been recorded visiting these flowers.
6.06	1. Global Invasive Species Database (2016) Species profile: <i>Merremia tuberosa</i> . Downloaded from http://www.iucngisd.org/gisd/species.php?sc=1279 on 27-04-2016. 2. Invasive Species Compendium http://www.cabi.org/isc/datasheet/115577 (4-27-2016)	<i>Merremia tuberosa</i> reproduces primarily through seed production and also by vegetative fragmentation. 2. is a fast-growing vine with the capability to reproduce sexually by seeds and vegetatively from discarded cuttings
6.07		no evidence
7.01	1. PIER http://www.hear.org/pier/species/merremia_tuberosa.htm (4-2-2016) 2. Invasive Species Compendium http://www.cabi.org/isc/datasheet/115577 (4-27-2016)	1. Mostly distributed by humans from discarded cuttings and floral arrangements containing seeds. 2. Because <i>M. tuberosa</i> spreads by seeds and vegetatively by cuttings, its probability of escaping from cultivation and becoming naturalized into new habitats is high.

7.02	1. Global Invasive Species Database (2016) Species profile: <i>Merremia tuberosa</i> . Downloaded from http://www.iucngisd.org/gisd/species.php?sc=1279 on 27-04-2016. 2. PIER http://www.hear.org/pier/species/merremia_tuberosa.htm (4-2-2016) 3. Invasive Species Compendium http://www.cabi.org/isc/datasheet/115577 (4-27-2016)	1. <i>Merremia tuberosa</i> was spread through as a medicine throughout Europe when it was discovered in Mexico, and subsequently through horticulture trade around the world. The roots contain resins that formerly were used across the tropics and in Europe as laxatives. Now it is grown and introduced for their flowers and ornamental fruits that are used by florists 2. Mostly distributed by humans from discarded cuttings and floral arrangements containing seeds. 3. However, it has been widely dispersed by humans to be used as medicine and through the horticulture trade around the world.
7.03		no evidence
7.04	1. Invasive Species Compendium http://www.cabi.org/isc/datasheet/115577 (4-27-2016)	1. Seeds can be dispersed by water, wind and humans
7.05	1. Florida Natural Areas Inventory http://www.fnai.org/Invasives/Merremia_tuberosa_FNAI.pdf (4-26-2016) 2. Invasive Species Compendium http://www.cabi.org/isc/datasheet/115577 (4-27-2016)	1. Seeds water dispersed. 2. Seeds can be dispersed by water, wind and humans
7.06		no evidence
7.07	1. Wagner. 1999. Flowering Plants of Hawaii. Volume 1. 563-564	No mechanism for attachment
7.08		no evidence
8.01	1. Wagner. 1999. Flowering Plants of Hawaii. Volume 1. 563-564	1. 4 seeds per fruit
8.02	1. Global Invasive Species Database (2016) Species profile: <i>Merremia tuberosa</i> . Downloaded from http://www.iucngisd.org/gisd/species.php?sc=1279 on 27-04-2016. 2. PIER http://www.hear.org/pier/species/merremia_tuberosa.htm (4-2-2016)	1. Its seeds remain viable for several years 2. Seeds remain viable for years.
8.03	1. PIER http://www.hear.org/pier/species/merremia_tuberosa.htm (4-2-2016) 2. University of Florida IFAS http://edis.ifas.ufl.edu/BODY_WG209 (4-27-2016)	1. Chemical: Basal application of a triclopyr herbicide mixed with an oil diluent. Remove seed pods to prevent reinfestation and recheck periodically for new seedlings. 2. Cut stem at ground level and treat with 50% Garlon 3A or 10% Garlon 4. A basal bark treatment with 10% Garlon 4 also works. The cut-stem treatment is preferred because it is evident within one week which stems were treated and which were missed.
8.04		no evidence
8.05		no evidence