	Dalechampia scandens (Spurge creeper)	**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 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		
3.03	Weed of agriculture		
3.04	Environmental weed	y	4
3.05	Congeneric weed		
4.01	Produces spines, thorns or burrs	y	1
4.02	Allelopathic		
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals		
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	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.		
4.11	Climbing or smothering growth habit	y	1
4.12	Forms dense thickets		
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	n	-1
6.04	Self-compatible or apomictic	y	1
6.05	Requires specialist pollinators	y	-1
6.06	Reproduction by vegetative propagation	y	1
6.07	Minimum generative time (years)		
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
7.02	Propagules dispersed intentionally by people	?	
7.03	Propagules likely to disperse as a produce contaminant		
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)	n	-1

8.01	Prolific seed production	?	
8.02	Evidence that a persistent propagule bank is formed (>1 yr)		
8.03	Well controlled by herbicides		
8.04	Tolerates, or benefits from, mutilation or cultivation		
8.05	Effective natural enemies present in U.S.		
	Total Score	**9**	
	Implemented Pacific Second Screening	**No**	
	Risk Assessment Results	**Reject**	

	Reference	Source data
1.01		Cultivated, but no evidence of selection for reduced weediness.
1.02		Skip to 2.01
1.03		Skip to 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 (11 September 2013). 3. Accessed through GBIF data. www.portal data.gbif.org/welcome.htm. Accessed: 9 Sept 2013 (specific references upon request). 4. Pemberton, R.W. & H. Liu. 2008. Naturalization of *Dalechampia scandens* in southern Florida. *Caribbean Journal of Science*, 44(3): 417-419.	**No computer analysis was performed**. 1. Global hardiness zone: 9-13; equivalent to USDA Hardiness zones 8a-11b (north, central, south zones of Florida). 2. Native to Africa (Angola, Cape Verde, Kenya, Mozambique, Tanzania, Uganda); Asia-Temperate (Oman, Saudi Arabia, Yemen); Caribbean (Antigua, Barbuda, Barbados, Cuba, Dominica, Grenada, Guadeloupe, Haiti, Martinique, Montserrat, Netherlands Antilles, Puerto Rico, St. Kitts & Nevis, St. Lucia, St. Vincent & Grenadines); Mesoamerica (Costa Rica, Gualtmala, Honduras, Nicaragua, Panama); North America (Mexico); South America (Boliva, Brazil, Columbia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Surinam, Venezuela). 3. Other countries with recorded specimens include Argentina, Belize, Burkina Faso, Cameroon, Dominican Republic, El Salvador, Ethiopia, France, Gabon, India, Indonesia, Madagascar, Mayotte, Namibia, Somalia, Swaziland, United States. 4.***NOTE: Recent analysis has found that the African species is not conspecific to the New World species (Armbruster 1987).
2.02		**No computer analysis was performed**. Native range is well known; refer to 2.01 source data.
2.03	1. Köppen-Geiger climate map (http://www.hydrol-earth-syst-sci.net/11/1633/2007/hess-11-1633-2007.pdf).	1. Distribution in the native and cultivated ranges is widespread and occurs in at least 3 climatic groups (Af, Am, Aw, BWh, BSh, BSk, Cwa, Cwb, etc).
2.04	1. The World Bank. http://data.worldbank.org/indicator/AG.LND.PRCP.MM. Accessed 06 Sept 2013.	1. 700 mm-3000 mm (29.5"-118").
2.05	1.a-b. Soria, M.C. et al. "Eradication of potentially invasive plants with limited distributions in the Galapagos Islands." *Turning the tide: the eradication of invasive species*. Ed. Veitch, C.R. & M.N. Clout. Cambridge: Occasional Paper of IUCN Species Survival Commission No. 27. 2002. 287-292. 2. Pemberton, R.W. & H. Liu. 2008. Naturalization of *Dalechampia scandens* in southern Florida. *Caribbean Journal of Science*, 44(3): 417-419.	1.a. *Dalechampia scandens* have dispersed from the agricultural zone and are starting to invade the arid and semi-arid areas of Santa Cruz. 1.b. *Dalechampia scandens* is included as an invasive species in Galapagos that are known or suspected to be causing significant ecological change, including in natural areas. 2. The species has been discovered at two sites in Broward County in southeastern Florida.
3.01	1.a-b. Soria, M.C. et al. "Eradication of potentially invasive plants with limited distributions in the Galapagos Islands." *Turning the tide: the eradication of invasive species*. Ed. Veitch, C.R. & M.N. Clout. Cambridge: Occasional Paper of IUCN Species Survival Commission No. 27. 2002. 287-292. 2. Pemberton, R.W. & H. Liu. 2008. Naturalization of *Dalechampia scandens* in southern Florida. *Caribbean Journal of Science*, 44(3): 417-419.	1.a. *Dalechampia scandens* have dispersed from the agricultural zone and are starting to invade the arid and semi-arid areas of Santa Cruz. 1.b. *Dalechampia scandens* is included as an invasive species in Galapagos that are known or suspected to be causing significant ecological change, including in natural areas.
3.02		
3.03		
3.04	1. Soria, M.C. et al. "Eradication of potentially invasive plants with limited distributions in the Galapagos Islands." *Turning the tide: the eradication of invasive species*. Ed. Veitch, C.R. & M.N. Clout. Cambridge: Occasional Paper of IUCN Species Survival Commission No. 27. 2002. 287-292.	1. *Dalechampia scandens* is included as an invasive species in Galapagos that are known or suspected to be causing significant ecological change, including in natural areas.
3.05		

4.01	1. Allen, P.H. 1943. Poisonous and Injurious Plants of Panama. *American Journal of Tropical Medicine and Hygiene*, 23(1): 3-76. 2. Nelson, L.S. et al. *AMA Handbook of Poisonous and Injurious Plants*. 2 ed. New York: Springer Science, 2005. E-book.	1. Most all *Dalechampia spp*. pistillate (female) flowers bear deeply lacinate sepals, which are covered with extremely annoying stiff, stinging hairs. 2. *D. scandens* included in list of species with external irritant, stinging hairs, or detachable needles.
4.02		
4.03		No evidence.
4.04		
4.05	1. 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 (11 September 2013).	1. Vertebrate poison: mammals.
4.06	1.a-b. Armbruster, W.S. 1982. Seed Production and Dispersal in *Dalechampia* (*Euphorbiaceae*): Divergent Patterns and Ecological Consequences. *American Journal of Botany*, 69(9): 1429-1440.	No evidence. 1.a. The principal seed predators observed on most species of *Dalechampia* were the larvae of the lepidopteran, *Dynamine* spp. (*Nymphalidae*, cf. Armbruster, in press). 1.b. All the viny species of *Dalechampia* that have been observed in detail are eaten by *Hamadryas* larvae. The adult butterflies lay eggs on the leaves either singly or in large masses; the larvae hatch and begin feeding on leaf tissues. The entire larval stage is spent feeding on *Dalechampia* leaves. At times the populations of *Hamadryas* on *Dalechampia* can become so large that plants are completely defoliated (Armbruster, ined; P. DeVries, pers. commun.)
4.07	1. Allen, P.H. 1943. Poisonous and Injurious Plants of Panama. *American Journal of Tropical Medicine and Hygiene*, 23(1): 3-76. 2. Nelson, L.S. et al. *AMA Handbook of Poisonous and Injurious Plants*. 2 ed. New York: Springer Science, 2005. E-book. 3. Armbruster, W.S. 1982. Seed Production and Dispersal in *Dalechampia* (*Euphorbiaceae*): Divergent Patterns and Ecological Consequences. *American Journal of Botany*, 69(9): 1429-1440. 4. Reed, B. & Wilson, R.C. 2001. Voodoo Powder as an Etiology of Leg Ulcers. *J. Am. Podiatry Med. Assoc*. 91: 324-325.	1. Most all *Dalechampia spp*. pistillate (female) flowers bear deeply lacinate sepals, which are covered with extremely annoying stiff, stinging hairs. 2. *D. scandens* included in list of species with external irritant, stinging hairs, or detachable needles. 3. The setae on both calyces and the capsules are very sharp and detach readily they easily penetrate the skin and may cause considerable irritation (to humans), much like the glochidia of cacti. 4. One of the most commonly used cutaneous poisons is known in Creole as “mashasha.” It is derived from the leaves of Dalechampia scandens3 and it is rapidly caustic to the skin.
4.08		No evidence.
4.09	1. Armbruster, W.S. 1982. Seed Production and Dispersal in *Dalechampia* (*Euphorbiaceae*): Divergent Patterns and Ecological Consequences. *American Journal of Botany*, 69(9): 1429-1440. 2. Pemberton, R.W. & H. Liu. 2008. Naturalization of *Dalechampia scandens* in southern Florida. *Caribbean Journal of Science*, 44(3): 417-419.	1. Most viny species are found in secondary scrub, seasonally dry habitats, and/or short-lived light gaps in forests, where rapid changes in light or moisture regimes might suddenly terminate reproduction. 2. The plants occur within the forest in deep shade.
4.10		
4.11	1. Pemberton, R.W. & H. Liu. 2008. Naturalization of *Dalechampia scandens* in southern Florida. *Caribbean Journal of Science*, 44(3): 417-419.	1. Vines grow up into the trees to heights of almost 7 m. Viny species climbs over shrubs and herbs, and into trees and cabbage palms.
4.12		
5.01	1. 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 (11 September 2013).	1. Family: *Euphorbiaceae*

5.02	1. 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 (11 September 2013).	1. Family: *Euphorbiaceae*
5.03	1. 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 (11 September 2013).	1. Family: *Euphorbiaceae*
5.04		No evidence of tubers, corms, or bulbs.
6.01		No evidence.
6.02	1. Armbruster, W.S. 1982. Seed Production and Dispersal in *Dalechampia* (*Euphorbiaceae*): Divergent Patterns and Ecological Consequences. *American Journal of Botany*, 69(9): 1429-1440. 2. Shahabuddin, G. et al. 2000. Persistence of a frugivorous butterfly species in Venezuelan forest fragments: the role of movement and habitat quality. *Biodiversity and Conservation*, 9: 1623–1641.	1. Seedlings are nearly always within 2 m of a putative parent plant, which is consistent with measurements of distances of ejection at dehiscence. 2. *D. scandens* propagates both through seed and vegetatively.
6.03	1. Armbruster, W.S. & N. Muchhala. 2009. Associations between floral specialization and species diversity: cause, effect, or correlation? *Evolution Ecology*, 23: 159-179.	1. Hybrids between *Dalechampia* spp are almost never found in the field, even when pollinators move between closely related species (e.g. Armbruster and Steiner 1992). An extensive interspecific crossing program between both sympatric and allopatric species in the greenhouse at the University of California Davis, conducted 1979–1981, resulted in no definitive hybrids (Armbruster and Herzig 1984; Armbruster unpublished data). This suggests strongly that there are effective postzygotic barriers to hybridization.
6.04	1. Armbruster, W.S. & D. Gobeille-Rogers. 2004. Does pollen competition reduce the cost of inbreeding? *American Journal of Botany*, 91(11): 1939-1943.	1. Although self-compatible, the blossoms secrete a terpenoid resin reward that attracts resin-collecting bees, usually resulting in considerable outcrossing in nature (Armbruster, 1985). In the absence of pollinators, however, flowers set seed readily through functional autogamy (within-blossom geitonogamy; Armbruster, 1988, 1993).
6.05	1. Armbruster, W.S. & N. Muchhala. 2009. Associations between floral specialization and species diversity: cause, effect, or correlation? *Evolution Ecology*, 23: 159-179. 2. Armbruster, W.S. 1984. The Role of Resin in Angiosperm Pollination: Ecological and Chemical Considerations. *American Journal of Botany*, 71(8): 1149-1160. 3. Hansen, T.F. et al. 2007. Comparing Variational Properties of Homologous Floral and Vegetative Characters in *Dalechampia scandens*: Testing the Berg Hypothesis. *Evolution Biology*, 34:86–98. 4. Pemberton, R.W. & H. Liu. 2008. Naturalization of *Dalechampia scandens* in southern Florida. *Caribbean Journal of Science*, 44(3): 417-419.	1. Pollination of most *Dalechampia* spp. is by resin-collecting bees, which use resin in nest construction (Armbruster 1993). 2. *Dalechampia* spp secrete resin to attract pollinators that collect resin for nest building, specifically bees, and some bees are effective pollinators as well, e.g., *Hypanthidium panamense* visits *D. scandens* to collect resin and pollen, making it an effective pollinator. 3. Different populations of *D. scandens* can be pollinated by resin-collecting bees of the genera *Eulaema, Eufrissea, Euglossa, Hypanthidium*, and *Trigona*, but local populations usually show a degree of adaptation to one type of bee (Armbruster 1985; Hansen et al. 2000), thus indicating a fairly specialized pollination system. 4. *Dalechampia scandens* is pollinated by *Euglossa viridissima*, a recently naturalized orchid bee in Florida, known to pollinate this species in Mexico.
6.06	1. Shahabuddin, G. et al. 2000. Persistence of a frugivorous butterfly species in Venezuelan forest fragments: the role of movement and habitat quality. *Biodiversity and Conservation*, 9: 1623–1641.	1. *D. scandens* propagates both through seed and vegetatively
6.07		
7.01		

7.02	1. Dr. Duke's Phytochemical and Ethnobotanical Databases. http://www.ars-grin.gov/duke/. Accessed 11 Sept 2013. 2. Reed, B. & Wilson, R.C. 2001. Voodoo Powder as an Etiology of Leg Ulcers. *J. Am. Podiatry Med. Assoc*. 91: 324-325.	1. Ethnobotanical uses include relief from toothache and bites from scorpions. 2. Leaves of *Dalechampia scandens* yield an oral potion that voodoo priests use medically as a cough suppressant.
7.03		
7.04	1. Armbruster, W.S. 1982. Seed Production and Dispersal in *Dalechampia* (*Euphorbiaceae*): Divergent Patterns and Ecological Consequences. *American Journal of Botany*, 69(9): 1429-1440.	1. The seeds of all 16 species of *Dalechampia* are dispersed by explosive dehiscence of the capsules. The capsule valves are under tension as they dry; when the valves split apart during dehiscence, each twists rapidly, flinging itself and the seed borne behind it away from the columella. The twisting of the segments of capsule walls occurs with great force; seeds are flung ca. 1-6 m. Excepting the effects of gravity and/or moving water, the dispersal of *Dalechampia* seeds appears to be solely the result of explosive dehiscence of the capsules.
7.05	1. Armbruster, W.S. 1982. Seed Production and Dispersal in *Dalechampia* (*Euphorbiaceae*): Divergent Patterns and Ecological Consequences. *American Journal of Botany*, 69(9): 1429-1440.	1.The seeds of all 16 species of *Dalechampia* are dispersed by explosive dehiscence of the capsules. The capsule valves are under tension as they dry; when the valves split apart during dehiscence, each twists rapidly, flinging itself and the seed borne behind it away from the columella. The twisting of the segments of capsule walls occurs with great force; seeds are flung ca. 1-6 m. Excepting the effects of gravity and/or moving water, the dispersal of *Dalechampia* seeds appears to be solely the result of explosive dehiscence of the capsules.
7.06	1. Armbruster, W.S. 1982. Seed Production and Dispersal in *Dalechampia* (*Euphorbiaceae*): Divergent Patterns and Ecological Consequences. *American Journal of Botany*, 69(9): 1429-1440.	1. The seeds themselves lack arils, caruncles or any other apparent "rewards" for animal dispersal agents.
7.07	1.a-b. Armbruster, W.S. 1982. Seed Production and Dispersal in *Dalechampia* (*Euphorbiaceae*): Divergent Patterns and Ecological Consequences. *American Journal of Botany*, 69(9): 1429-1440.	1.a. Seeds are too large and smooth to attach externally to animals. 1.b. The lack of clumping of seedlings suggests that they are not transported by ants to their nests (van der Pijl, 1969; Horvitz and Beattie, 1980) or cached by rodents.
7.08	1. Armbruster, W.S. 1982. Seed Production and Dispersal in *Dalechampia* (*Euphorbiaceae*): Divergent Patterns and Ecological Consequences. *American Journal of Botany*, 69(9): 1429-1440.	1. The seeds themselves lack arils, caruncles or any other apparent "rewards" for animal dispersal agents. The lack of clumping of seedlings suggests that they are not transported by or cached by rodents.
8.01	1. Pemberton, R.W. & H. Liu. 2008. Naturalization of *Dalechampia scandens* in southern Florida. *Caribbean Journal of Science*, 44(3): 417-419.	1. Abundant seed being produced.
8.02		
8.03		
8.04		
8.05		