Australia/New Zealand Weed Risk Assessment adapted for United States.

Data used for analysis published in: Gordon, D.R. and C.A. Gantz. 2008. Potential impacts on the horticultural industry of screening new plants for invasiveness. Conservation Letters 1: 227-235. Available at: http://www3.interscience.wiley.com/cgi-bin/fulltext/121448369/PDFSTART

Heliconia steyermarkii			
Question number	**Question**	**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 U.S. climates (USDA hardiness zones; 0-low, 1-intermediate, 2-high)	1	
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high)	1	
2.03	Broad climate suitability (environmental versatility)	?	
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?	?	
3.01	Naturalized beyond native range	n	-1
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		
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic		
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals		
4.05	Toxic to animals	n	0
4.06	Host for recognised pests and pathogens		
4.07	Causes allergies or is otherwise toxic to humans	n	0
4.08	Creates a fire hazard in natural ecosystems		
4.09	Is a shade tolerant plant at some stage of its life cycle		
4.1	Grows on one or more of the following soil types: alfisols, entisols, or mollisols	y	1
4.11	Climbing or smothering growth habit	?	
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	?	
6.01	Evidence of substantial reproductive failure in native habitat	n	0
6.02	Produces viable seed	?	
6.03	Hybridizes naturally		
6.04	Self-compatible or apomictic		
6.05	Requires specialist pollinators	?	
6.06	Reproduction by vegetative fragmentation	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	n	-1
7.03	Propagules likely to disperse as a produce contaminant	n	-1
7.04	Propagules adapted to wind dispersal	n	-1
7.05	Propagules water dispersed		
7.06	Propagules bird dispersed	?	
7.07	Propagules dispersed by other animals (externally)	n	-1
7.08	Propagules dispersed by other animals (internally)		
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			-2

Outcome	**Accept**

section	**# questions answered**	**satisfy minimum?**
A	8	Yes
B	5	Yes
C	9	Yes
total	22	yes

Data collected 2008

Question number	Reference	Source data
1.01		used horticulturally, but no evidence of significant modification
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. Aristeguieta, L (1964) Dos especies nuevas para la ciencia del genero *Heliconia* en Venezuela. Sociedad Venezolana de Ciencias Naturales Boletin, Tomo XXV, Numero 107.	1. Global hardiness zones 12-13. 2. "Tipo: Edo. Sucre, Península de Paria, Venezuela".
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. Aristeguieta, L (1964) Dos especies nuevas para la ciencia del genero *Heliconia* en Venezuela. Sociedad Venezolana de Ciencias Naturales Boletin, Tomo XXV, Numero 107.	1. Uncertain about distribution range -- possibly 2-3 climatic regions. 2. "Tipo: Edo. Sucre, Península de Paria, Venezuela".
2.04	Atlapedia Online (http://www.atlapedia.com/online/countries/venezual.htm).	For Venezuela: the wet season is from May to November with an average annual precipitation varying from 1,400 mm (55 inches) in the Andes to 280 mm (11 inches) on the coast.
2.05		no evidence
3.01		no evidence
3.02		no evidence
3.03		no evidence
3.04		no evidence
3.05		
4.01	Aristeguieta, L (1964) Dos especies nuevas para la ciencia del genero *Heliconia* en Venezuela. Sociedad Venezolana de Ciencias Naturales Boletin, Tomo XXV, Numero 107.	no description of these traits

4.02		
4.03	Aristeguieta, L (1964) Dos especies nuevas para la ciencia del genero *Heliconia* en Venezuela. Sociedad Venezolana de Ciencias Naturales Boletin, Tomo XXV, Numero 107.	no description of parasitism
4.04		
4.05	Aristeguieta, L (1964) Dos especies nuevas para la ciencia del genero *Heliconia* en Venezuela. Sociedad Venezolana de Ciencias Naturales Boletin, Tomo XXV, Numero 107.	no evidence
4.06		
4.07	Aristeguieta, L (1964) Dos especies nuevas para la ciencia del genero *Heliconia* en Venezuela. Sociedad Venezolana de Ciencias Naturales Boletin, Tomo XXV, Numero 107.	no evidence
4.08		
4.09		
4.1	USDA, National Resources Conservation Services (NRCS), Soil Survey Division, World Soil Resources (http://soils.usda.gov/use/worldsoils/mapindex/order.html).	The Sucre region of Venezuela is comprised entirely of ultisols.
4.11	Kress, WJ, Betancur, J, and Echeverry, B (1999) Heliconias: llamaradas de la selva colombiana. Cristina Uribe Editores, Santafé de Bogota, Colombia.	"Las Heliconias son plantas herbaceas de tamano variable que pueden alcanzar hasta 12 m de altura" [• Heliconias are herbaceous plants that come in variable sizes which can reach up to 12 m tall] [genus description].
4.12		
5.01		terrestrial
5.02	Aristeguieta, L (1964) Dos especies nuevas para la ciencia del genero *Heliconia* en Venezuela. Sociedad Venezolana de Ciencias Naturales Boletin, Tomo XXV, Numero 107.	Heliconiaceae
5.03	Aristeguieta, L (1964) Dos especies nuevas para la ciencia del genero *Heliconia* en Venezuela. Sociedad Venezolana de Ciencias Naturales Boletin, Tomo XXV, Numero 107.	Heliconiaceae
5.04	Kress, WJ, Betancur, J, and Echeverry, B	"Crecen a través de tallos subterráneos

	(1999) Heliconias: llamaradas de la selva colombiana. Cristina Uribe Editores, Santafé de Bogota, Colombia.	(rizomas) que envián brotes (vástagos) a la superficie" [It grows using rhizomes that send new sprouts to the soil surface] [genus description].
6.01	Aristeguieta, L (1964) Dos especies nuevas para la ciencia del genero *Heliconia* en Venezuela. Sociedad Venezolana de Ciencias Naturales Boletin, Tomo XXV, Numero 107.	no evidence
6.02	1. Kress, WJ, Betancur, J, and Echeverry, B (1999) Heliconias: llamaradas de la selva colombiana. Cristina Uribe Editores, Santafé de Bogota, Colombia. 2. Kress, WJ (1984) Systematic of Central American *Heliconia* (*Heliconiaceae*) with pendent inflorescences. Journal of the Arnold Arboretum 65(1): 429-532.	1. "El retraso en su germinación" [Late germination] [genus description]. 2. "Delayed germination of *Heliconia* seeds often encountered by horticulturists" [genus description].
6.03		
6.04		
6.05	Kress, WJ, Betancur, J, and Echeverry, B (1999) Heliconias: llamaradas de la selva colombiana. Cristina Uribe Editores, Santafé de Bogota, Colombia.	"Adaptadas y correlacionadas directamente con el largo y lacurvatura del pico del colibrí que poliniza cada especie particular de heliconia" [These plants have adapted and directly coordinate with the long and curved beak of a hummingbird that pollinates every heliconia species] [genus description].
6.06	Kress, WJ, Betancur, J, and Echeverry, B (1999) Heliconias: llamaradas de la selva colombiana. Cristina Uribe Editores, Santafé de Bogota, Colombia.	"Crecen a través de tallos subterráneos (rizomas) que envián brotes (vástagos) a la superficie" [It grows using rhizomes that send new sprouts to the soil surface] [genus description].
6.07		
7.01		
7.02		no evidence
7.03		no evidence
7.04	1. Kress, WJ, Betancur, J, and Echeverry, B (1999) Heliconias: llamaradas de la selva colombiana. Cristina Uribe Editores, Santafé de Bogota, Colombia. 2. Kress, WJ (1984) Systematic of Central American *Heliconia* (*Heliconiaceae*) with pendent inflorescences. Journal of the Arnold	1. "El fruto de las heliconias es una drupa con un endocarpo muy duro que contiene de 1 a 3 semillas" [*Heliconia* fruits are drupaceous with a hard endocarp that contains 1 to 3 seeds] [genus description]. 2. "The mature fruit of *Heliconia* is a drupe with a stony endocarp enclosing each of the true seeds...the outer pericarp is fleshy, and

	Arboretum 65(1): 429-532.	at maturity the surface layer becomes blue (Neotropical species)" [genus description]. [no evidence of adaptations to wind dispersal]
7.05		
7.06	1. Kress, WJ, Betancur, J, and Echeverry, B (1999) Heliconias: llamaradas de la selva colombiana. Cristina Uribe Editores, Santafé de Bogota, Colombia. 2. Kress, WJ (1984) Systematic of Central American *Heliconia* (*Heliconiaceae*) with pendent inflorescences. Journal of the Arnold Arboretum 65(1): 429-532.	1. "La parte externa es carnosa y se vuelve azul al madurar, lo que las hace muy atractivas para los pájaros que las dispersan" [The external part is pulpy and turns blue as it ripens, which calls the attention of birds that disperse them]. [genus description]. 2. "The fruits are very attractive to birds that disperse the seeds" [genus description].
7.07	1. Kress, WJ, Betancur, J, and Echeverry, B (1999) Heliconias: llamaradas de la selva colombiana. Cristina Uribe Editores, Santafé de Bogota, Colombia. 2. Kress, WJ (1984) Systematic of Central American *Heliconia* (*Heliconiaceae*) with pendent inflorescences. Journal of the Arnold Arboretum 65(1): 429-532.	1. "El fruto de las heliconias es una drupa con un endocarpo muy duro que contiene de 1 a 3 semillas" [Heliconia fruits are drupaceous with a hard endocarp that contains 1 to 3 seeds] [genus description]. 2. "The mature fruit of *Heliconia* is a drupe with a stony endocarp enclosing each of the true seeds...the outer pericarp is fleshy, and at maturity the surface layer becomes blue (Neotropical species)" [genus description]. [no evidence of adaptations to external dispersal]
7.08		
8.01		
8.02		
8.03		
8.04		
8.05		