

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>

<i>Chione sylvicola</i>			
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)	2	
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high)	2	
2.03	Broad climate suitability (environmental versatility)	n	0
2.04	Native or naturalized in regions with an average of 11-60 inches of annual precipitation	?	
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	n	0
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	n	0
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		
6.04	Self-compatible or apomictic		
6.05	Requires specialist pollinators	?	
6.06	Reproduction by vegetative fragmentation		
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	y	1
7.07	Propagules dispersed by other animals (externally)	?	
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)	n	-1
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
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section	# questions answered	satisfy minimum?
A	9	Yes
B	6	Yes
C	11	Yes
total	26	yes

Data collected 2008

Question number	Reference	Source data
1.01		possibly cultivated, but no evidence of significant modification [most of the data found has been from naturalized populations]
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%20Ign d.tif). 2. Burger WC and Taylor CM (1993) <i>Flora Costaricensis</i> . Family #202 Rubiaceae. <i>Fieldiana Botany</i> 33: 98-99. 3. 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?417657). 4. Stevens, WD, Ulloa, CU, Pool, A, and Montiel, OM (2001) <i>Flora de Nicaragua</i> . Monographs in Systematic Botany from the Missouri Botanical Garden. Volume 85. Missouri Botanical Garden Press, St. Louis.	1. Global hardiness zones 9-12. 2. "The species ranges from southeastern Nicaragua to central Panama" 3. Mesoamerica: Costa Rica; Nicaragua [s.e.]; Panama. 4. In the Atlantic and north central regions of Nicaragua; south of Mexico to western Colombia. [tropical]
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. Burger WC and Taylor CM (1993) <i>Flora Costaricensis</i> . Family #202 Rubiaceae. <i>Fieldiana Botany</i> 33: 98-99. 3. 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?417657). 4. Stevens, WD, Ulloa, CU, Pool, A, and Montiel, OM (2001) <i>Flora de Nicaragua</i> . Monographs in Systematic Botany from the Missouri Botanical Garden. Volume 85. Missouri Botanical Garden Press, St. Louis.	1. One climatic region. 2. "The species ranges from southeastern Nicaragua to central Panama" 3. Mesoamerica: Costa Rica; Nicaragua [s.e.]; Panama. 4. In the Atlantic and north central regions of Nicaragua; south of Mexico to western Colombia. [only 1-2 biomes]
2.04	1. Microsoft Encarta World Precipitation and Average Rainfall (http://uk.encarta.msn.com/encnet/RefPages/RefMedia.aspx?refid=461530746&artrefid=761554737&pn=3&sec=-1). 2. <i>Atlopedia Online</i>	1. For Nicaragua, average annual precipitation ranges from 60 inches/year to 80+ inches/year. 2. For Panama: average annual precipitation varies from 1,780 mm (70 inches) to 2,540 (100 inches)

	(http://www.atlappedia.com/online/countries/).	depending on the region; For Costa Rica: average annual precipitation is 3,300 mm (130 inches) and rainfall patterns vary from region to region.
2.05		no evidence
3.01		no evidence
3.02		no evidence
3.03		no evidence
3.04		no evidence
3.05		no evidence
4.01	Burger WC and Taylor CM (1993) Flora Costaricensis. Family #202 Rubiaceae. Fieldiana Botany 33: 98-99.	no description of these traits
4.02		
4.03	Burger WC and Taylor CM (1993) Flora Costaricensis. Family #202 Rubiaceae. Fieldiana Botany 33: 98-99.	no description of parasitism
4.04		
4.05	Harvey CA and Haber WA (1999) Remnant trees and the conservation of biodiversity in Costa Rican pastures. Agroforestry Systems 44: 37-68.	Birds use the species as a food source [but part of the plant that is eaten is not listed]. [no evidence of toxicity]
4.06		
4.07	Burger WC and Taylor CM (1993) Flora Costaricensis. Family #202 Rubiaceae. Fieldiana Botany 33: 98-99.	no evidence
4.08		
4.09		
4.1	1. USDA, National Resources Conservation Services (NRCS), Soil Survey Division, World Soil Resources (http://soils.usda.gov/use/worldsoils/mapindex/order.html). 2. Taylor DW (2003) A taxonomic revision of the genus Chione (Rubiaceae). Systematics and Geography of Plants 73: 171-198.	1. Belize: inceptisols, mollisols, and ultisols are the only soil orders present; Colombia (western): alfisols, entisols, and ultisols are the main soil order types, but oxisols and andisols are also present in this region; Costa Rica: the region is comprised mostly of ultisols, with a small amount of inceptisols (but there is a small amount of andisols present); El Salvador: mostly

		ultisols with a small amount of inceptisols and entisols (but with andisols on the Pacific Coast); Guatemala: main soil order types are ultisols, alfisols, and mollisols, with a small amount of inceptisols (and a small region of andisols on the Pacific Coast); Honduras: mostly ultisols, alfisols, and inceptisols, with a very small amount of mollisols and entisols; Mexico (south): mostly inceptisols, mollisols, and ultisols, with a very small amount of entisols and mollisols (and a very small amount of andisols); Nicaragua: mostly ultisols and inceptisols with some alfisols (and andisols on the Pacific Coast); Panama: almost entirely ultisols with a very small amount of inceptisols (and a very small amount of andisols). 2. "often on limestone outcrops, on calcareous, clay, or organic soils"
4.11	1. Burger WC and Taylor CM (1993) Flora Costaricensis. Family #202 Rubiaceae. Fieldiana Botany 33: 98-99. 2. Stevens, WD, Ulloa, CU, Pool, A, and Montiel, OM (2001) Flora de Nicaragua. Monographs in Systematic Botany from the Missouri Botanical Garden. Volume 85. Missouri Botanical Garden Press, St. Louis.	1. Shrubs or trees, (2-)6-15(-23) m tall. 2. Trees and shrubs up to 23 m tall.
4.12		
5.01		terrestrial
5.02	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?417657).	Rubiaceae
5.03	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?417657).	Rubiaceae
5.04	1. Burger WC and Taylor CM (1993) Flora	1. Shrubs or trees, (2-)6-15(-23) m

	Costaricensis. Family #202 Rubiaceae. Fieldiana Botany 33: 98-99. 2. Stevens, WD, Ulloa, CU, Pool, A, and Montiel, OM (2001) Flora de Nicaragua. Monographs in Systematic Botany from the Missouri Botanical Garden. Volume 85. Missouri Botanical Garden Press, St. Louis.	tall. 2. Trees and shrubs up to 23 m tall.
6.01		no evidence
6.02	1. Wenny DG (2005) Post-dispersal seed fate of some cloud forest tree species in Costa Rica. In: Seed fate: predation, dispersal and seedling establishment. Editors: Forget PM, Lambert JE, Hulme PE, Vander Wall SB. Wallingford, Oxfordshire, UK: CABI Publishing. 2. Taylor DW (2003) A taxonomic revision of the genus <i>Chione</i> (Rubiaceae). Systematics and Geography of Plants 73: 171-198.	1. "The seed does not split upon germination, but the seedling emerges from one end of the seed". 2. "No scarification or acid treatment of the pyrene was necessary for germination of seeds in Matthaei Botanical Garden".
6.03		
6.04		
6.05	Taylor DW (2003) A taxonomic revision of the genus <i>Chione</i> (Rubiaceae). Systematics and Geography of Plants 73: 171-198.	"Flowers...attract visitors from many insect groups: Coleoptera (small beetles), Diptera, Hymenoptera (bees and wasps), and Lepidoptera. No observations have been conducted to reveal which, if any, of these visitors effect pollination."
6.06		
6.07		
7.01		
7.02		no evidence
7.03		
7.04	1. Burger WC and Taylor CM (1993) Flora Costaricensis. Family #202 Rubiaceae. Fieldiana Botany 33: 98-99. 2. Wenny DG (2005) Post-dispersal seed fate of some cloud forest tree species in Costa Rica. In: Seed fate: predation, dispersal and seedling establishment. Editors: Forget PM, Lambert JE, Hulme PE, Vander Wall SB. Wallingford, Oxfordshire, UK: CABI Publishing. 3. Stevens, WD, Ulloa, CU, Pool, A, and Montiel, OM (2001) Flora de Nicaragua. Monographs in Systematic Botany from the Missouri Botanical Garden. Volume 85. Missouri Botanical Garden Press, St. Louis.	1. "Fruits 14-22 mm long, 7-11 mm diam., ellipsoid or curved". 2. " <i>Chione sylvicola</i> seeds had hard and thick seeds that could not be cut with a pocket knife." 3. Drupaceous fruits, ellipsoid to fusiform, 15-20 mm long and 8-10 mm wide, pulpy, red or purple. [no evidence of adaptations to wind dispersal]
7.05	Taylor DW (2003) A taxonomic revision of the genus <i>Chione</i> (Rubiaceae). Systematics and Geography of	"Due to their greater proportion of sclerenchymatized pyrene cells,

	Plants 73: 171-198.	and their overall larger size, the fruits of <i>Chione</i> do not appear to be as well constructed for floatation. However dried fruits from Costa Rica are capable of floating in tap water for nine days."
7.06	1. Wenny DG (2005) Post-dispersal seed fate of some cloud forest tree species in Costa Rica. In: Seed fate: predation, dispersal and seedling establishment. Editors: Forget PM, Lambert JE, Hulme PE, Vander Wall SB. Wallingford, Oxfordshire, UK: CABI Publishing. 2. Taylor DW (2003) A taxonomic revision of the genus <i>Chione</i> (Rubiaceae). Systematics and Geography of Plants 73: 171-198. 3. Stevens, WD, Ulloa, CU, Pool, A, and Montiel, OM (2001) Flora de Nicaragua. Monographs in Systematic Botany from the Missouri Botanical Garden. Volume 85. Missouri Botanical Garden Press, St. Louis.	1. Disperser = birds. 2. "Mature fruits have a red to dark purple, fleshy exocarp"; "one collector has reported birds eating these fruits". 3. Drupaceous fruits, ellipsoid to fusiform, 15-20 mm long and 8-10 mm wide, pulpy, red or purple.
7.07	1. Burger WC and Taylor CM (1993) Flora Costaricensis. Family #202 Rubiaceae. Fieldiana Botany 33: 98-99. 2. Wenny DG (2005) Post-dispersal seed fate of some cloud forest tree species in Costa Rica. In: Seed fate: predation, dispersal and seedling establishment. Editors: Forget PM, Lambert JE, Hulme PE, Vander Wall SB. Wallingford, Oxfordshire, UK: CABI Publishing.	1. "Fruits 14-22 mm long, 7-11 mm diam., ellipsoid or curved". 2. " <i>Chione sylvicola</i> seeds had hard and thick seeds that could not be cut with a pocket knife."; "animals seldom removed seeds with thick, hard seed coats regardless of size (<i>C. sylvicola</i>)" but "caching cannot be ruled out for <i>C. sylvicola</i> " and some seeds were moved by animals in the study.
7.08	Taylor DW (2003) A taxonomic revision of the genus <i>Chione</i> (Rubiaceae). Systematics and Geography of Plants 73: 171-198.	"Mature fruits have a red to dark purple, fleshy exocarp".
8.01		
8.02	Taylor DW (2003) A taxonomic revision of the genus <i>Chione</i> (Rubiaceae). Systematics and Geography of Plants 73: 171-198.	"No scarification or acid treatment of the pyrene was necessary for germination of seeds in Matthaei Botanical Garden".
8.03		
8.04		
8.05		