UF IFAS UNIVERSITY of FLORIDA

Assessment of Non-native Plants in Florida's Natural Areas

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Assessment date 31 March 2016

	Syngonium podophyllum **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	y	4
3.04	Environmental weed	y	4
3.05	Congeneric weed	y	2
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	n	-1
4.05	Toxic to animals	y	1
4.06	Host for recognised pests and pathogens	unk	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.	unk	0
4.11	Climbing or smothering growth habit	y	1
4.12	Forms dense thickets	n	0
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	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)		
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	n	-1
7.04	Propagules adapted to wind dispersal	n	-1
7.05	Propagules water dispersed	y	1
7.06	Propagules bird dispersed	?	
7.07	Propagules dispersed by other animals (externally)	n	-1
7.08	Propagules dispersed by other animals (internally)	y	1
8.01	Prolific seed production	n	-1
8.02	Evidence that a persistent propagule bank is formed (>1 yr)	n	-1
8.03	Well controlled by herbicides	y	-1
8.04	Tolerates, or benefits from, mutilation or cultivation		
8.05		?	
	Total Score	**16**	
	Implemented Pacific Second Screening	**no**	
	Risk Assessment Results	**High**	

section	**# questions answered**	**satisfy minimum?**
A	11	yes
B	10	yes
C	18	yes
total	39	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 (1-8-2016).	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 Northern America: Mexico Southern America Brazil: Brazil Caribbean: Trinidad and Tobago - Trinidad Mesoamerica: Belize; Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua; Panama Northern South America: French Guiana; Guyana; Suriname; Venezuela Western South America: Bolivia; Colombia; Ecuador; Peru
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/2867866 (1-8-2015)	1. Distribution in the native/cultivated range occurs in Af, Aw, Am, Cfa
2.04	1. Climate Charts. World Climate Maps. http://www.climate-charts.com/World-Climate-Maps.html#rain (8-19-2015)	Native to areas with 39 to 196 inches of precipitation yearly.
2.05	1. 2013 by Michael A. Arnold with all rights reserved; intended for future inclusion in Landscape Plants For Texas And Environs, Fourth Edition. http://aggie-horticulture.tamu.edu/syllabi/308/Lists/Fourth%20Edition/Syngoniumpodophyllum%20%20H.pdf (1-8-2016) 2. Global Invasive Species Database http://www.issg.org/database/species/ecology.asp?si=1562 (1-13-2016)	1. Native to Central America and South America; it is extensively cultivated and occasionally escaped elsewhere in subtropical and tropical locations 2. Syngonium podophyllum is an ornamental vine native to Central and parts of South America that has established invasive populations in the United States, South Africa, Singapore, the Carribbean, and on several Pacific islands.
3.01	1. Queensland Government http://keyserver.lucidcentral.org/weeds/data/080c0106-040c-4508-8300-0b0a06060e01/media/html/Syngonium_podophyllum.htm (1-8-2016) 2. Chong, K.Y., Ang, P.T. and Tan, H.T.W. (2010) Identity and spread of an exotic Syngonium species in Singapore. Nature in Singapore, 3: 1–5.	This species is naturalised in the coastal districts of south-eastern, central and northern Queensland. It currently has a scattered distribution, but is quickly becoming more common and widespread. Possibly also becoming naturalised in south-western Western Australia. Also naturalised on some Pacific islands (i.e. American Samoa, Niue and Hawaii) and in south-eastern USA (i.e. Florida). 2. The identity of the common, wild Syngonium species in Singapore is Syngonium podophyllum Schott var. podophyllum. We document its status as a naturalised exotic, supported by evidence that it produces viable seeds and has spontaneously spread to many parts of Singapore, including the nature reserves.
3.02	Queensland Government http://keyserver.lucidcentral.org/weeds/data/080c0106-040c-4508-8300-0b0a06060e01/media/html/Syngonium_podophyllum.htm (1-8-2016)	It is a weed of rainforests, closed forests, open woodlands, waterways and riparian areas, roadsides, disturbed sites, waste areas and abandoned gardens in tropical and sub-tropical regions.
3.03	1. De Waele et al., 2006, D. De Waele, R. Stoffelen, J. Kestemont Effect of associated plant species on banana nematodes InfoMusa, 15 (2006), pp. 2–6	1. The weed Syngonium podophyllum (arrowhead vine), which climbs up the pseudostem of a banana plant, can cause serious problems in plantations.

3.04	1. Queensland Government http://keyserver.lucidcentral.org/weeds/data/080c0106-040c-4508-8300-0b0a06060e01/media/html/Syngonium_podophyllum.htm (1-8-2016)	1. It is a weed of rainforests, closed forests, open woodlands, waterways and riparian areas, roadsides, disturbed sites, waste areas and abandoned gardens in tropical and sub-tropical regions… Syngonium (Syngonium podophyllum) is regarded as an environmental weed in Queensland, and as a potential environmental weed or "sleeper weed " in other parts of northern and eastern Australia.
3.05	1. Queensland Government http://keyserver.lucidcentral.org/weeds/data/080c0106-040c-4508-8300-0b0a06060e01/media/html/Syngonium_angustatum.htm (1-8-2016)	Syngoniums (Syngonium spp.) are regarded as environmental weeds in Queensland, where they invade urban bushland, riparian vegetation, coastal environs, open woodlands and closed forests. Until recently Syngonium podophyllum was thought to be the only problem species in Queensland, but there are actually three closely related species present in this state (i.e. Syngonium podophyllum, Syngonium neglectum and Syngonium angustatum)
4.01	1. Queensland Government http://keyserver.lucidcentral.org/weeds/data/080c0106-040c-4508-8300-0b0a06060e01/media/html/Syngonium_podophyllum.htm (1-8-2016)	1. The species is not described with these features
4.02		no evidence
4.03		no evidence
4.04		no evidence
4.05	1. ASPCA https://www.aspca.org/pet-care/animal-poison-control/toxic-and-non-toxic-plants/arrow-head-vine (1-8-2016) 2. Pet Poison Helpline http://www.petpoisonhelpline.com/poison/arrowhead-vine/ (1-8-2016)	1. Toxic to Dogs, Toxic to Cats 2. Poisonous to: Cats, Dogs
4.06	1. 2013 by Michael A. Arnold with all rights reserved; intended for future inclusion in Landscape Plants For Texas And Environs, Fourth Edition. http://aggie-horticulture.tamu.edu/syllabi/308/Lists/Fourth%20Edition/Syngoniumpodophyllum%20%20H.pdf (1-8-2016) 2. Chase, A.R., P.S. RandhawaandR.H. Lawson. 1988. Anew disease of Syngonium podophyllum 'White Butterfly' caused by a pathovar of Xanthomonas campestris. Plant Disease 72:74-78.	Under low humidity or drought stress, the margins of the foliage become necrotic; relatively few serious insect or disease problems occur, occasionally bacterial leaf spot, soft rot, aphids, mealybugs, scale, and spidermites are problems, mostly in greenhouse or interiorscape settings. 2. A serious new foliar blight of S. podophyllum cv. White Butterfly is described. A slow-growing xanthomonad that readily caused blight symptoms was consistently isolated from affected plants. The bacterium was specific to species and cultivars of Syngonium, causing blight within 10 d of misting with a suspension containing 1 × 108 c.f.u./ml. Standard biochemical tests and EM showed the pathogen to be X. campestris. Biochemical and biological comparisons of X.c. pv. dieffenbachiae and X.c. pv. vitians were performed because both have been reported as pathogens of Syngonium spp. In vitro tests, including growth response to temp., carbohydrate utilization, gelatin hydrolysis and pectolysis as well as fatty acid analysis, revealed differences among the 3 groups of organisms. Also symptomatology on S. podophyllum and host range varied considerably among the strs.
4.07	1. FDA http://www.accessdata.fda.gov/scripts/plantox/detail.cfm?id=7262 (1-8-2016) 2. 2013 by Michael A. Arnold with all rights reserved; intended for future inclusion in Landscape Plants For Texas And Environs, Fourth Edition. http://aggie-horticulture.tamu.edu/syllabi/308/Lists/Fourth%20Edition/Syngoniumpodophyllum%20%20H.pdf (1-8-2016) 3. Dave's Garden http://davesgarden.com/guides/pf/go/54483/#b (1-8-2016)	1. Listed on the FDA poisonous plants database. 2. Plants are reported to be poisonous if ingested 3. All parts of plant are poisonous if ingested
4.08		no evidence
4.09	1. Dave's Garden http://davesgarden.com/guides/pf/go/54483/#b (1-8-2016) 2. PIER http://www.hear.org/pier/species/syngonium_podophyllum.htm (1-8-2016)	1. Sun to Partial Shade, Light Shade 2. Grows under shady conditions.

4.10		Incomplete soil data
4.11	1. 2013 by Michael A. Arnold with all rights reserved; intended for future inclusion in Landscape Plants For Texas And Environs, Fourth Edition. http://aggie-horticulture.tamu.edu/syllabi/308/Lists/Fourth%20Edition/Syngoniumpodophyllum%20%20H.pdf (1-8-2016) 2. Queensland Government http://keyserver.lucidcentral.org/weeds/data/080c0106-040c-4508-8300-0b0a06060e01/media/html/Syngonium_podophyllum.htm (1-8-2016)	Syngonium podophyllum begins as small herbaceous mounds, slowly develop sprawling, pendent or climbing branches to an indeterminate length 2. A rampant creeper or climbing plant that grows over other vegetation, often reaching 5-10 m or more in height when climbing larger trees.
4.12		no evidence
5.01		Family: Araceae
5.02		Family: Araceae
5.03		no evidence
5.04		no evidence
6.01		no evidence
6.02	1. PIER http://www.hear.org/pier/species/syngonium_podophyllum.htm (1-8-2016) 2. Chong, K.Y., Ang, P.T. and Tan, H.T.W. (2010) Identity and spread of an exotic Syngonium species in Singapore. Nature in Singapore, 3: 1–5.	1. Mostly, if not exclusively, vegetative 2. Attempts to germinate the seeds extracted from the ripened fruits were successful.
6.03		no evidence
6.04		
6.05		no evidence
6.06	1. Queensland Government http://keyserver.lucidcentral.org/weeds/data/080c0106-040c-4508-8300-0b0a06060e01/media/html/Syngonium_podophyllum.htm (1-8-2016) 2. Dave's Garden http://davesgarden.com/guides/pf/go/54483/#b (1-8-2016) 3. PIER http://www.hear.org/pier/species/syngonium_podophyllum.htm (1-8-2016)	1. This species almost exclusively reproduces vegetatively in the wild, and is propagated and spread by cuttings in cultivation. 2. Reproduces by dividing rhizomes, tubers, corms or bulbs (including offsets) From herbaceous stem cuttings By simple layering By serpentine layering By stooling or mound layering 3. Mostly, if not exclusively, vegetative
6.07		no evidence
7.01	1. Queensland Government http://keyserver.lucidcentral.org/weeds/data/080c0106-040c-4508-8300-0b0a06060e01/media/html/Syngonium_podophyllum.htm (1-8-2016)	1. Stem segments and cuttings are commonly dispersed in dumped garden waste and woodchips. Once established, a plant will spread outwards, forming a colony, and taking root wherever its stems touch the ground. Stem segments can also be spread by mowers, slashes and floodwaters.
7.02	1. Global Invasive Species Database http://www.issg.org/database/species/ecology.asp?si=1562 (1-13-2016) 2. Dave's Garden http://davesgarden.com/guides/pf/go/54483/#b (1-8-2016)	1. Most of its introductions are believed the result of its planting as an ornamental or escape from cultivation. 2. Popular garden plant
7.03		no evidence
7.04		no evidence
7.05	1. Queensland Government http://keyserver.lucidcentral.org/weeds/data/080c0106-040c-4508-8300-0b0a06060e01/media/html/Syngonium_podophyllum.htm (1-8-2016)	1. Stem segments and cuttings are commonly dispersed in dumped garden waste and woodchips. Once established, a plant will spread outwards, forming a colony, and taking root wherever its stems touch the ground. Stem segments can also be spread by mowers, slashes and floodwaters.
7.06	1. Chong, K.Y., Ang, P.T. and Tan, H.T.W. (2010) Identity and spread of an exotic Syngonium species in Singapore. Nature in Singapore, 3: 1–5.	1. the red spathe of the ripe infructescence may suggest that birds are the dispersers of the seeds
7.07	1. Queensland Government http://keyserver.lucidcentral.org/weeds/data/080c0106-040c-4508-8300-0b0a06060e01/media/html/Syngonium_podophyllum.htm (1-8-2016)	No mechanism for attachment in the species description

7.08	1. Flora of Singapore https://floraofsingapore.wordpress.com/2009/11/11/syngonium-podophyllum/ (1-13-2016)	1. Dispersed by mammals
8.01	1. Queensland Government http://keyserver.lucidcentral.org/weeds/data/080c0106-040c-4508-8300-0b0a06060e01/media/html/Syngonium_podophyllum.htm (1-8-2016)	1. This fruit (3.5-7 cm long and 1.5-3.5 cm wide) is egg-shaped (i.e. ovoid) and turns brownish when fully mature. It contains numerous black or brown seeds (7-11 mm long and 5-7 mm wide) that are contained within a soft greyish-coloured pulp.
8.02		no evidence
8.03	1. IFAS https://edis.ifas.ufl.edu/in530 (1-8-2016) 2. Syngonium Podophyllum Control in Citrus, Belize Citrus Growers Association www.belizecitrus.org (1-13-2015)	1. Herbicides alone or in combination with hand pulling can be used to control arrowhead vine. Herbicide products with the active ingredient glyphosate (examples: Roundup Pro Concentrate, Glyphos, Glypro Plus, Touchdown Pro, Roundup Weed and Grass Killer Concentrate) or triclopyr (examples: Garlon 3A, Garlon 4, Brush-B-Gon, Brush Killer) are applied to the foliage and stems. Roundup Weed and Grass Killer Concentrate, Brush-B-Gon, and Brush Killer can be purchased from retail garden supply stores. 2. Various herbicides are used to control this weed. All have short comings in that they are not 100 percent effective.
8.04		no evidence
8.05		no evidence