UF IFAS UNIVERSITY of FLORIDA

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

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Assessment date 12 February 2015

	***Phyllostachys aureosulcata (Yellow Groove Bamboo)*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		
3.04	Environmental weed	unk	
3.05	Congeneric weed	y	2
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic	unk	0
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	unk	0
4.07	Causes allergies or is otherwise toxic to humans	n	0
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	unk	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	n	0
4.12	Forms dense thickets	y	1
5.01	Aquatic	n	0
5.02	Grass	y	1
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	?	
6.05	Requires specialist pollinators	n	0
6.06	Reproduction by vegetative propagation	y	1
6.07	Minimum generative time (years)	>4	-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	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)		
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	y	1
8.05			
	Total Score	**8**	
	Implemented Pacific Second Screening	**no**	
	Risk Assessment Results	**High**	

section	**# questions answered**	**satisfy minimum?**
A	9	yes
B	6	yes
C	19	yes
total	34	yes

	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. DavesGarden. 2014. Plant files database http://davesgarden.com/guides/pf/go/81044/#ixzz3M4rfM5w4. 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?409896 (00 Month 0000).	No computer analysis was performed. 1. Global hardiness zone: 7, 8, and 9; 2. equivalent to USDA Hardiness zones: USDA Zone 5a: to -28.8 °C (-20 °F) USDA Zone 5b: to -26.1 °C (-15 °F) USDA Zone 6a: to -23.3 °C (-10 °F) USDA Zone 6b: to -20.5 °C (-5 °F) USDA Zone 7a: to -17.7 °C (0 °F) USDA Zone 7b: to -14.9 °C (5 °F) USDA Zone 8a: to -12.2 °C (10 °F) USDA Zone 8b: to -9.4 °C (15 °F) 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) . 3. Native to ASIA Temperate China - Anhui, Jiangsu, Zhejiang
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). 2.EDDMapS. 2014. Early Detection & Distribution Mapping System. The University of Georgia - Center for Invasive Species and Ecosystem Health. Available online at http://www.eddmaps.org/; last accessed December 15, 2014.	1. Distribution in the native/cultivated range occurs in Cfa, Cwa, Cfb, Dfb
2.04	1. ChinaMaps http://www.chinamaps.org/china/provincemaps/jiangsu.html (12-15-2014), 2. World Bank http://sdwebx.worldbank.org/climateportal/index.cfm?page=country_historical_climate&ThisRegion=Asia&ThisCCode=CHN (12-15-2014)	29.5 inches to 59 inches
2.05	1. Chalet Nursery http://plants.chaletnursery.com/12120004/Plant/5623/Yellow_Grove_Bamboo (12-15-2014), 2. Lewis Bamboo http://www.lewisbamboo.com/yellowgr.html (12-15-2014), 3. Tropicos http://www.tropicos.org/name/25525266 (12-15-2014)	Readily available from Internet nurseries.
3.01	1. Kartesz, J.T., The Biota of North America Program (BONAP). 2014. North American Plant Atlas. (http://bonap.net/napa). Chapel Hill, N.C. [maps generated from Kartesz, J.T. 2014. Floristic Synthesis of North America, Version 1.0. Biota of North America Program (BONAP). (in press)]	Evidence of naturalization present in Pennsylvania, West Virginia, Texas, Georgia, Alabama, Mississippi , Tennessee, Virginia, Maryland, Maine, New York, Connecticut, and Kentucky.
3.02	United States Department of Agriculture Animal and Plant Health Inspection Service August 20, 2012 Version 1 Weed Risk Assessment for Phyllostachys aureosulcata McClure (Poaceae) – Yellow groove bamboo	"P. aureosulcata is spreading into neighboring properties, sending rhizomes and shoots into yards, gardens, hedges, etc.; homeowners are trying to control it by cutting and digging up rhizomes but removal is proving difficult."
3.03		No evidence
3.04	1. Young, R. A., and J. R. Haun. 1961. Bamboo in the United States: description, culture, and utilization. Agricultural Handbook No. 193. USDA Crops Research Division, Agricultural Research Service, Washington, D.C 2. Email from Jeffrey Ward, CT Agricultural Experiment Station, to Leslie Newton, CPHST PERAL, dated 5/29/2012	1.If this bamboo were to become established along a stream, it could alter food webs; its congener, P. aurea, is said to have this effect. 2. "I have never seen a species so thoroughly dominate a site and form a monoculture that completely excludes other species"
3.05	United States Department of Agriculture Animal and Plant Health Inspection Service August 20, 2012 Version 1 Weed Risk Assessment for Phyllostachys aureosulcata McClure (Poaceae) – Yellow groove bamboo	"Phyllostachys pubescens has invaded forests in Japan, forming uniform monolayers of foliage (monoculture), and dominating competing vegetation; between 1975 and 1993, this bamboo had replaced the trees in a once-mixed forest (Isagi and Torii, 1977). Phyllostachys flexuosa is reported to form dense stands which prevent native vegetation from growing (GISD, 2008)."

4.01	Clayton, W.D., Vorontsova, M.S., Harman, K.T. and Williamson, H. (2006 onwards). GrassBase - The Online World Grass Flora. http://www.kew.org/data/grasses-db.html. (12-16-2014)	These traits are not a part of the species description.
4.02		No evidence
4.03	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 (00 Month 0000). (12-16-2014)	1. Family: Poaceae (not a parasitic family).
4.04		No Evidence
4.05	North Caralina Zoo www.chimpcare.org/assets/forums/NC_Zoo_Browse_list_2012.docx (12-16-2014)	Approved by the North Caralina Zoo as acceptable feed for mammals.
4.06		No evidence
4.07		No evidence
4.08		No evidence
4.09	1. Halvorson, J. J., K. A. Cassida, K. E. Turner, and D. P. Belesky. 2010. Nutritive value of bamboo as browse for livestock. Renewable Agriculture and Food Systems 26(2):161-170. 2. DavesGarden. 2014. Plant files database http://davesgarden.com/guides/pf/go/81044/#ixzz3M4rfM5w4 (12-16-2014)	1. Preference for full sun.; 2. Full sun to partial shade.
4.10	Plants for a Future http://www.pfaf.org/user/Plant.aspx?LatinName=Phyllostachys+aureosulcata (12-16-2014)	Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: acid, neutral and basic (alkaline) soils. It prefers moist soil.
4.11	Young, R. A., and J. R. Haun. 1961. Bamboo in the United States: description, culture, and utilization. Agricultural Handbook No. 193. USDA Crops Research Division, Agricultural Research Service, Washington, D.C	This plant is neither a vine nor does it have a basal rosette of leaves.
4.12	United States Department of Agriculture Animal and Plant Health Inspection Service August 20, 2012 Version 1 Weed Risk Assessment for Phyllostachys aureosulcata McClure (Poaceae) – Yellow groove bamboo, as referenced in Warda, J. S. 2012a. Email from Jeffrey Ward, CT Agricultural Experiment Station, to Leslie Newton, CPHST PERAL, dated 5/29/2012.	Where well-established in full sunlight, this bamboo forms dense, nearly impenetrable thickets with no native vegetation.
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 (00 Month 0000).	1. Family: Poaceae.
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 (00 Month 0000).	1. Family: Poaceae.
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 (00 Month 0000).	1. Family: Poaceae.
5.04	1. Wang, K. et al. 2010. Identification of genes related to the development of bamboo rhizome bud. Journal of Experimental Botany, 61(2): 551–561.	1. According to the type of the rhizome, bamboos have been divided into three groups: scattered bamboos with a monopodial rhizome, caespitose bamboos with a sympodial rhizome, and pluricaespitose bamboos with a monopodial and sympodial rhizome. The rhizome bud can either develop into a bamboo shoot which will grow into a bamboo culm in a very short period, or develop into a new rhizome which will enable the sustainable production of the bamboo grove.
6.01		No evidence found

6.02	1. John, CK et al. 1994. Selection - A valuable method for bamboo improvement. Current Science (Bangalore), 66(11): 822-824.	The most easy method of bamboo propagation is by means of seeds. Propagation of economically important bamboo species by seeds is not possible annually because of their very long inter-mast periods.
6.03	1. John, CK et al. 1994. Selection - A valuable method for bamboo improvement. Current Science (Bangalore), 66(11): 822-824.	1. The peculiar flowering behaviour in bamboos make genetic improvement by hybridizations very difficult. The flowering and seeding at long intervals (7-120 years) render the overlapping of flowering in more than one species, in the same locality very difficult to obtain, making attempts at hybridizations impossible.
6.04	1. John, CK et al. 1994. Selection - A valuable method for bamboo improvement. Current Science (Bangalore), 66(11): 822-824. 2. Why Bamboos Wait so Long to Flower, Daniel H. Janzen, Annual Review of Ecology and Systematics, Vol. 7, (1976), pp. 347-391	1. Reproductive biology is not well understood in most of the species. Two categories are apparent so far: (i) species which exhibit dichogamy and protogyny and (ii) species in which the androecium and gynoecium mature at the same time. In species under the first category, only cross-pollination is possible. In the second category selfing is difficult because of the differential position of the anthers and the stigma, when they are mature. 2. Evidence suggests that (bamboo) flowers are cross-pollinated, suggesting that isolated clones may produce few or no seeds
6.05	1. Shor, B., Southern California Chapter. From Flowers to Seedlings. American Bamboo Society. Accessed: 18 March 2014. http://www.bamboo.org/GeneralInfoPages/FromFlowersToSeedlings.html	1. Most bamboos are wind-pollinated. Insects may be involved with some species.
6.06	1. Wang, K. et al. 2010. Identification of genes related to the development of bamboo rhizome bud. Journal of Experimental Botany, 61(2): 551–561.	1. The rhizome bud can either develop into a bamboo shoot which will grow into a bamboo culm in a very short period, or develop into a new rhizome which will enable the sustainable production of the bamboo grove.
6.07	1. Plants for a Future (www.pfaf.org)	1. "Plants only flower at intervals of many years. "
7.01	Langeland, K. A., and R. K. Stocker. 2001. Control of non-native plants in natural areas of Florida (SP 242). University of Florida, Institute of Food and Agricultural Sciences, Gainseville, FL, U.S.A. 34 pp.	Can become established by dumping of yard waste containing rhizome fragments
7.02	1. Scurlock et al. 2000 Bamboo: an overlooked biomass resource? Biomass and Bioenergy, 19:229-244. 2. Liese and Hamburg. 1987. Research on bamboo. Wood Science and Technology, 21:189-209	1. Cultivated for erosion control, windbreaks, building material, food, bamboo fiber clothes, etc. 2. Also, has been proposed as a source for pulp for paper and possible biofuel source.
7.03	1. John, CK et al. 1994. Selection - A valuable method for bamboo improvement. Current Science (Bangalore), 66(11): 822-824.	1. Very unlikely. The longevity of the seeds varies from species to species, but usually only last 2-3 months under natural conditions. Furthermore, seeds must be sowed immediately in optimal conditions to prevent damping off.
7.04		No morphological features (i.e., wings) that would suggest bamboo seeds are adapted for wind.
7.05	United States Department of Agriculture Animal and Plant Health Inspection Service August 20, 2012 Version 1 Weed Risk Assessment for Phyllostachys aureosulcata McClure (Poaceae) – Yellow groove bamboo	The presence of naturalized stands of P. aureosulcata beside rivers and streams suggests that culms and rhizomes can be moved by water and washed downstream from upstream sources
7.06		No evidence found
7.07		No morphological features that would suggest bamboo seeds are adapted for attachment.
7.08		No evidence
8.01	Why Bamboos Wait so Long to Flower, Daniel H. Janzen, Annual Review of Ecology and Systematics, Vol. 7, (1976), pp. 347-391	Seed production occurs rarely in bamboos; this bamboo spreads vegetatively via rhizome growth
8.02	1. John, CK et al. 1994. Selection - A valuable method for bamboo improvement. Current Science (Bangalore), 66(11): 822-824.	1. The longevity of the seeds varies from species to species. Under natural conditions it is for 2-3 months.

8.03	1. United States Department of Agriculture Animal and Plant Health Inspection Service August 20, 2012 Version 1 Weed Risk Assessment for Phyllostachys aureosulcata McClure (Poaceae) – Yellow groove bamboo 2. Andrew Z. Skibo (2006), University of Delaware, Invasive Plant List - Planting for a Livable Delaware	1. Phyllostachys aurea, P. aureosulcata, and P. bambusoides can be controlled but requires 1+ years with herbicide; effective herbicides include glyphosate (Roundup(®) and diclobenil (Casoron®, Barrier®) (Ward, 2012b) 2. Few herbicides are effective on bamboo. The only treatment regime that has been proven to be effective are winter applications of diclobenil (Casoron or Barrier) combined with summer spot sprays with glyphosate (Roundup). Diclobenil will kill many of the rhizomes and prevent others from re-establishing through early summer. After that time new sprouts will emerge and must be controlled to prevent re-establishment. Recent research has shown that glyphosate (Roundup, Roundup-Pro, Glyfos, others) works better than other postemergence herbicides (such as Finale) for this purpose. However, Roundup does not translocate well to the rhizomes and bamboo will re-sprout. Reapply Roundup whenever new growth is present. It will take at least two years of this regime to attain control.
8.04	1. and 2. United States Department of Agriculture Animal and Plant Health Inspection Service August 20, 2012 Version 1 Weed Risk Assessment for Phyllostachys aureosulcata McClure (Poaceae) – Yellow groove bamboo	1. That P. aureosulcata tolerates mutilation is evident by the difficulty people have in controlling the spread of this bamboo. 2. This bamboo is widely cultivated.
8.05		No evidence found