

Assessment date 25 March 2015

<i>Wisteria sinensis</i>--Chinese wisteria: 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		
3.03	Weed of agriculture	n	0
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	y	1
4.05	Toxic to animals	y	1
4.06	Host for recognised pests and pathogens		
4.07	Causes allergies or is otherwise toxic to humans	y	1
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	?	
4.10	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils). North & Central Zones: infertile soils; South Zone: shallow limerock or Histisols.	y	1
4.11	Climbing or smothering growth habit	y	1
4.12	Forms dense thickets	y	1
5.01	Aquatic	n	0
5.02	Grass	n	0
5.03	Nitrogen fixing woody plant	y	1
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	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	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	n	-1
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	y	1
8.05			
Total Score			15
Implemented Pacific Second Screening			n/a
Risk Assessment Results			High

section	# questions answered	satisfy minimum?
A		10 yes
B		9 yes
C		19 yes
total		38 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 (20 March 2015).	No computer analysis was performed. 1. Global hardiness zone: 5, 6, 7, 8, 9, 10; 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 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) USDA Zon. 2. Native to ASIA-TEMPERATE China: China - Guangxi, Guizhou, Hebei, Henan, Hubei, Shaanxi, Yunnan
2.02		
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/cultivated range occurs in Cfa, Cwa, Bsk, Dwa
2.04	1. Atlas of the biosphere: Annual total precipitation(http://www.sage.wisc.edu/atlas/ [accessed 3/25/2015]) 2. Global Biodiversity Information Facility (www.GBIF.org [accessed 3/25/2015])	1. & 2. Plants growing in Europe, China, Australia, and New Zealand in areas receiving btween 7.5-97 inches (the mean represented in the data is the standard 30 year mean running from 1960 to 1990)
2.05	1. Martin, Tunyalee. Weed Notes. Wildland Invasive Species Team/The Nature Conservancy http://www.invasive.org/gist/moredocs/wisspp01.pdf (3-23-2015) 2. INVASIVE PLANT ATLAS OF THE MIDSOUTH http://www.gri.msstate.edu/ipams/species.php?SName=Wisteria%20sinensis (3-23-2015) 3. Flora of China http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=20012368 (2-23-2015)	1. Chinese wisteria was introduced into the U.S. from China in 1816 as an ornamental. This invasive vine can be found throughout the eastern U.S., south of (and including) TX, AR, MS, IL, KY, WV, PA, NY, VT, and MA, and it has also been reported as far north as MI 2. Wisterias are widespread in the MidSouth. Introduced species and hybrids are typically associated with old home sites, but can be problematic in newer landscapes if not maintained properly. 3. This species is cultivated extensively in areas beyond its native range.
3.01	1. Swearingen, J. Remaley, T. 2010 Plant Conservation Alliance®s Alien Plant Working Group http://www.nps.gov/plants/alien/fact/pdf/wisi1.pdf (3-20-2015) 2. TRUSTY, J. L., LOCKABY, B. G., ZIPPERER, W. C. and GOERTZEN, L. R. (2008), Horticulture, hybrid cultivars and exotic plant invasion: a case study of Wisteria (Fabaceae). Botanical Journal of the Linnean Society, 158: 593–601. doi: 10.1111/j.1095-8339.2008.00908.x	1. Found extensively throughout the eastern U.S., Chinese wisteria has been reported to be invasive in at least 19 states from Massachusetts to Illinois south to Texas and also in Hawaii. 2. Naturalized plants occur throughout the eastern USA and range from Vermont to Florida and westward to Texas and Arkansas
3.02	1. Kaufman, S. R., and W. Kaufman. 2007. Invasive Plants: Guide to Identification and the Impacts and Control of Common North American Species. Stackpole Books, Mechanisburg, PA. 221 pp	1. So far it has done more damage to homes than to the natural environment.
3.03		no evidence

3.04	<p>1. Swearingen, J. Remaley, T. 2010 Plant Conservation Alliance®s Alien Plant Working Group http://www.nps.gov/plants/alien/fact/pdf/wisi1.pdf (3-20-2015)</p> <p>2. Martin, Tunyalee. Weed Notes. Wildland Invasive Species Team/The Nature Conservancy http://www.invasive.org/gist/moredocs/wisspp01.pdf (3-23-2015)</p> <p>3. INVASIVE PLANT ATLAS OF THE MIDSOUTH http://www.gri.msstate.edu/ipams/species.php?SName=Wisteria%20sinensis (3-23-2015)</p> <p>4. Invasive Plant Atlas of the United States http://www.invasiveplantatlas.org/subject.html?sub=3083 (3-25-2015)</p>	<p>1. The hard woody vines of Chinese wisteria twine tightly around host tree trunks and branches and cut through the host tree bark, eventually girdling and killing it. On the ground, new vines germinating from seed or sprouting from rootstocks form dense thickets that smother and shade out native vegetation and impede natural plant community development. As girdled trees die, canopy gaps are created which increase the amount of sunlight reaching the forest floor. While this may temporarily favor some native species, it also stimulates vigorous growth and spread of wisteria. 2. Wisteria sinensis can displace native vegetation and kill trees and shrubs by girdling them. The vine has the ability to change the structure of a forest by killing trees and altering the light availability to the forest floor. 2. Chinese wisteria can harm wildland species by twining around native shrubs and trees, and shading out light. The death of large trees results in breaks in closed canopies, which favors further growth of wisteria. 3. Once established, wisteria can be difficult to eradicate and can persist for years strangling native trees and shrubs trying to colonize the site. They can also kill, or disfigure, desirable trees in the landscape. 4. Invasions often occur around previous plantings. Chinese wisteria can displace native vegetation and kill trees and shrubs by girdling them. The vine has the ability to change the structure of a forest by killing trees and altering the light availability to the forest floor.</p>
3.05	<p>1. Kaufman, S. R., and W. Kaufman. 2007. Invasive Plants: Guide to Identification and the Impacts and Control of Common North American Species. Stackpole Books, Mechanisburg, PA. 221 pp</p> <p>2. Brochure from The Flint River Conservation Association and the Monte Sano State Park working with the Alabama Invasive Plant Council (ALIPC) http://www.montesano.org/wp-content/uploads/MSDirtyDozenInvasivePlants.pdf (3-25-2015)</p>	<p>1. Wisteria floribunda is also considered an invasive weed. 2. Wisteria floribunda kills trees by girdling them.</p>
4.01	<p>Flora of China http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200012368 (2-23-2015)</p>	<p>The species description does not include these features.</p>
4.02		<p>Fabaceae family</p>
4.03		<p>Fabaceae family</p>
4.04	<p>Cornell University Department of Animal Science http://www.ansci.cornell.edu/plants/php/plants.php?action=indiv&byname=scientific&keynum=93 (3-25-2015)</p>	<p>This plant is poisonous to livestock</p>
4.05	<p>1. INVASIVE PLANT ATLAS OF THE MIDSOUTH http://www.gri.msstate.edu/ipams/species.php?SName=Wisteria%20sinensis (3-23-2015)</p> <p>2. Cornell University Department of Animal Science http://www.ansci.cornell.edu/plants/php/plants.php?action=indiv&byname=scientific&keynum=93 (3-25-2015)</p> <p>3.</p>	<p>1. However, fruit are poisonous and most likely not dispersed frequently by wildlife. 2. This plant is poisonous to livestock 3.</p>
4.06	<p>Missouri Botanical Garden http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=265643&isprofile=0& (3-20-2015)</p>	<p>1. Although susceptible to a number of foliage-chewing insects and fungal diseases, none are significant.</p>

4.07	<p>1. Martin, Tunyalee. Weed Notes. Wildland Invasive Species Team/The Nature Conservancy http://www.invasive.org/gist/moredocs/wisspp01.pdf (3-23-2015) 2. Stone, Katharine R. 2009. <i>Wisteria floribunda</i>, <i>W. sinensis</i>. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2015, March 23]. 3. Global Invasive Species Database http://www.issg.org/database/species/ecology.asp?si=287&fr=1&sts= (3-25-2015)</p>	<p>1. Both species have pods and seeds that are toxic if ingested causing such symptoms as nausea, vomiting, stomach pains and diarrhea 2. A number of reviews list wisteria flowers, leaves, fruits, and seeds as poisonous 3. The seeds and pods of <i>Wisteria sinensis</i> are toxic if ingested</p>
4.08	<p>Stone, Katharine R. 2009. <i>Wisteria floribunda</i>, <i>W. sinensis</i>. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2015, March 23].</p>	<p>Specifically, invasive vines could increase fuel loading and continuity, and contribute to the likelihood of crown fire by acting as a ladder fuel. The density, spatial extent, and climbing nature of wisteria populations suggest that they may alter fuel characteristics in invaded communities.</p>
4.09	<p>1. Swearingen, J. Remaley, T. 2010 Plant Conservation Alliance®s Alien Plant Working Group http://www.nps.gov/plants/alien/fact/pdf/wisi1.pdf (3-20-2015) 2. Missouri Botanical Garden http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=265643&isprofile=0& (3-20-2015) 3. Plants For A Future http://www.pfaf.org/user/Plant.aspx?LatinName=Wisteria+sinensis (3-20-2015) 4. Stone, Katharine R. 2009. <i>Wisteria floribunda</i>, <i>W. sinensis</i>. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2015, March 23]. 5. Edward F. Gilman, professor, Environmental Horticulture Department, Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, 32611.</p>	<p>1. <i>Wisteria</i> prefers full sun, but established vines will persist and reproduce in partial shade. 2. Full sun is needed for best flowering. 3. It cannot grow in the shade. 4. <i>Wisterias</i> grow best in full sun but are tolerant of shade 5. Chinese wisteria is a shade-tolerant vine</p>
4.10	<p>1. Swearingen, J. Remaley, T. 2010 Plant Conservation Alliance®s Alien Plant Working Group http://www.nps.gov/plants/alien/fact/pdf/wisi1.pdf (3-20-2015) 2. Love To Know: Gardening http://garden.lovetoknow.com/wiki/Wisteria (3-25-2015) 3. USDA Natural Resource Conservation Service Soils, Global Soil Regions Map http://www.nrcs.usda.gov/Internet/FSE_MEDIA/nrcs142p2_050722.jpg (3-25-2015)</p>	<p>1. It is tolerant of a variety of soil and moisture regimes but prefers deep, loamy, well drained soils. 2. <i>Wisteria</i> flowers best in a location with full sun and relatively poor, infertile soil. It needs good drainage and is a great performer in dry, rocky places. 3. <i>Wisteria</i> is native areas with similar soil characteristics to Florida.</p>
4.11	<p>1. Swearingen, J. Remaley, T. 2010 Plant Conservation Alliance®s Alien Plant Working Group http://www.nps.gov/plants/alien/fact/pdf/wisi1.pdf (3-20-2015) 2. Plants For A Future http://www.pfaf.org/user/Plant.aspx?LatinName=Wisteria+sinensis (3-20-2015) 3. INVASIVE PLANT ATLAS OF THE MIDSOUTH http://www.gri.msstate.edu/ipams/species.php?SName=Wisteria%20sinensis (3-23-2015)</p>	<p>1. Vines climb trees, shrubs and manmade structures. 2. <i>Wisteria sinensis</i> is a deciduous Climber growing to 25 m (82ft) by 20 m (65ft) at a medium rate. 3. Chinese and Japanese wisterias are high climbing vines</p>

4.12	1. Martin, Tunyalee. Weed Notes. Wildland Invasive Species Team/The Nature Conservancy http://www.invasive.org/gist/moredocs/wisspp01.pdf (3-23-2015) 2. Kaufman, S. R., and W. Kaufman. 2007. Invasive Plants: Guide to Identification and the Impacts and Control of Common North American Species. Stackpole Books, Mechanisburg, PA. 221 p. 3. INVASIVE PLANT ATLAS OF THE MIDSOUTH http://www.gri.msstate.edu/ipams/species.php?SName=Wisteria%20sinensis (3-23-2015)	1. Chinese wisteria and Japanese wisteria both overtake natives and grow in dense thickets, excluding all other plants 2. When it reproduces by runners, it can also form wisteria thickets 3. It can form dense thickets, replacing the surrounding native vegetation.
5.01		Family: Fabaceae
5.02		Family: Fabaceae
5.03	1. Robyn J. Burnham, University of Michigan http://climbers.lsa.umich.edu/?p=437 (3-25-2015) 2. Stone, Katharine R. 2009. Wisteria floribunda, W. sinensis. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2015, March 23].	1. Like most other members of Fabaceae, Wisteria is nitrogen-fixing 2. woody plant
5.04		no evidence
6.01		no evidence
6.02	1. Missouri Botanical Garden http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=265643&isprofile=0& (3-20-2015) 2. INVASIVE PLANT ATLAS OF THE MIDSOUTH http://www.gri.msstate.edu/ipams/species.php?SName=Wisteria%20sinensis (3-23-2015) 3. Swearingen, J. Remaley, T. 2010 Plant Conservation Alliance®s Alien Plant Working Group http://www.nps.gov/plants/alien/fact/pdf/wisi1.pdf (3-20-2015)	1. Seeds may be produced when conditions are favorable. 2. Wisteria if dispersed vegetatively by stem growth or sexually by seed. 3. New vines germinate from seeds
6.03	Trusty JL, Zipperer WC, Lockaby BG, Goertzen LR. Identity of naturalized exotic Wisteria in the Southeastern United States. Weed Res 2007. in press.	It is possible that hybridisation of the floribunda and sinensis genomes has occurred many times in different locations or, alternatively, that Wisteria hybrids are commonly propagated and spread through horticulture...Our study has found that nearly all naturalised Wisteria sampled are hybrids...Our data suggest that hybridisation may be playing a key role in its invasiveness.
6.04		No evidence
6.05	Stone, Katharine R. 2009. Wisteria floribunda, W. sinensis. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2015, March 23].	Visited by hummingbirds and insects.
6.06	1. Swearingen, J. Remaley, T. 2010 Plant Conservation Alliance®s Alien Plant Working Group http://www.nps.gov/plants/alien/fact/pdf/wisi1.pdf (3-20-2015) 2. Martin, Tunyalee. Weed Notes. Wildland Invasive Species Team/The Nature Conservancy http://www.invasive.org/gist/moredocs/wisspp01.pdf (3-23-2015) 3. INVASIVE PLANT ATLAS OF THE MIDSOUTH http://www.gri.msstate.edu/ipams/species.php?SName=Wisteria%20sinensis (3-23-2015)	1. Vegetative reproduction is the primary means of growth and spread. Slender stems (stolons, runners) grow horizontally across the ground and develop new plants (roots and shoots) at the nodes. 2. Although seeds are produced in favorable conditions, vegetative growth is the main method of wisteria spread. 3. Wisteria if dispersed vegetatively by stem growth or sexually by seed.

6.07	<p>1. Plants For A Future http://www.pfaf.org/user/Plant.aspx?LatinName=Wisteria+sinesis (3-20-2015) 2. Ohio State University Extension Fact Sheet http://ohioline.osu.edu/hyg-fact/1000/1246.html (3-25-2015)</p>	<p>1. Plants are very slow from seed and can take up to 20 years to come into flower 2. Plants that have been grown from seed remain in a long juvenile stage and often do not bloom for 10 to 15 years or longer. Plants that are grafted, and plants grown from cuttings or layered from a flowering plant will usually begin flowering earlier than seedlings.</p>
7.01	<p>1. Swearingen, J. Remaley, T. 2010 Plant Conservation Alliance's Alien Plant Working Group http://www.nps.gov/plants/alien/fact/pdf/wisi1.pdf (3-20-2015) 2. Stone, Katharine R. 2009. <i>Wisteria floribunda</i>, <i>W. sinensis</i>. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2015, March 23]. 3. Global Invasive Species Database http://www.issg.org/database/species/ecology.asp?si=287&fr=1&sts= (3-25-2015)</p>	<p>1. Infestations are commonly found along forest edges, roadsides, ditches, and rights-of-way. 2. <i>Wisterias</i> form dense infestations that spread from horticultural plantings 3. natural forests, riparian zones, ruderal/disturbed, urban areas</p>
7.02	<p>1. Swearingen, J. Remaley, T. 2010 Plant Conservation Alliance's Alien Plant Working Group http://www.nps.gov/plants/alien/fact/pdf/wisi1.pdf (3-20-2015) 2. Stone, Katharine R. 2009. <i>Wisteria floribunda</i>, <i>W. sinensis</i>. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2015, March 23]. 3. Global Invasive Species Database http://www.issg.org/database/species/ecology.asp?si=287&fr=1&sts= (3-25-2015)</p>	<p>1. It has been grown extensively in the southern U.S. as a decorative addition to porches, gazebos, walls, and gardens. Most infestations in natural areas are a result of escapes from landscape plantings. 2. <i>Wisterias</i> are used extensively in the southern and mid-Atlantic states to adorn porches, gazebos, walls, gardens and parks, and most infestations in natural areas are the result of plants escaping from such settings 3. <i>W. sinensis</i> is a popular ornamental</p>
7.03		no evidence
7.04	<p>Stone, Katharine R. 2009. <i>Wisteria floribunda</i>, <i>W. sinensis</i>. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2015, March 23].</p>	<p><i>Wisteria</i> pods and seeds are large and heavy</p>
7.05	<p>1. Swearingen, J. Remaley, T. 2010 Plant Conservation Alliance's Alien Plant Working Group http://www.nps.gov/plants/alien/fact/pdf/wisi1.pdf (3-20-2015) 2. Martin, Tunyalee. Weed Notes. Wildland Invasive Species Team/The Nature Conservancy http://www.invasive.org/gist/moredocs/wisspp01.pdf (3-23-2015) 3. Stone, Katharine R. 2009. <i>Wisteria floribunda</i>, <i>W. sinensis</i>. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2015, March 23].</p>	<p>1. Seeds may be produced when conditions are favorable. In riparian areas these may be carried by water downstream for great distances. 2. Rivers can carry seeds downstream to further the spread of this invasive vine 3. Seeds are water-dispersed along riparian areas and can travel great distances this way</p>
7.06	<p>Stone, Katharine R. 2009. <i>Wisteria floribunda</i>, <i>W. sinensis</i>. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2015, March 23].</p>	<p><i>Wisteria</i> pods and seeds are large and heavy, which limits dispersal by birds and mammals</p>