UF IFAS UNIVERSITY of FLORIDA

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

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ALL ZONES

Assessment date: 09/01/2021 Prepared by Sara McCann (review D. Lieurance)

	Cassia Bakeriana **(pink cassia)**	**Answer**	**Score**
1.01	Is the species highly domesticated?	n	0
1.02	Has the species become naturalised where grown?	0	
1.03	Does the species have weedy races?	0	
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	3	
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high)	3	
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?	n	
3.01	Naturalized beyond native range	?	
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	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	?	
4.05	Toxic to animals	n	0
4.06	Host for recognised pests and pathogens	n	0
4.07	Causes allergies or is otherwise toxic to humans	n	0
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.	y	1
4.11	Climbing or smothering growth habit	n	0
4.12	Forms dense thickets	n	0
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	?	
6.07	Minimum generative time (years)	?	
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n	-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	n	-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)	y	1
8.03	Well controlled by herbicides	y	-1
8.04	Tolerates, or benefits from, mutilation or cultivation	?	
8.05	Effective natural enemies present in U.S.	?	
	Total Score	**0**	
	Implemented Pacific Second Screening	**NO**	
	Risk Assessment Results	**accept**	

section	**# questions answered**	**satisfy minimum?**
A	10	yes
B	11	yes
C	18	yes
total	39	yes

	Evidence	Reference
1.01	No evidence of domestication.	0
1.02	0	0
1.03	0	0
2.01	1. Hardiness zones 10-12. 2. 10-12, and winter hardy to 9b. 3. 9a-11 * NOTE THIS QUESTION IS ANSWERED AS "2" FOR THE NORTH ZONE, BUT IT DID NOT AFFECT THE SCORE	1. Caldwell, Doug. 2014. Flowering Trees for Southwest Florida. UF IFAS Extention. http://blogs.ifas.ufl.edu/collierco/files/2018/03/Flowering-Trees-Southwest-Florida.pdf (Accessed September 1, 2021). 2. Cassia bakeriana. Missouri Botanical Garden. http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=280525 (Accessed September 1, 2021). 3. Dave's Garden https://davesgarden.com/guides/pf/go/69495/#b (9/6/2021)
2.02	No computer analysis performed. * NOTE THIS QUESTION IS ANSWERED AS "2" FOR THE NORTH ZONE, BUT IT DID NOT AFFECT THE SCORE	0
2.03	1. Cassia is present in koppen climates Af and Aw. 2. Its native range is a tropical climate. 3. "Its original climate is humid tropical, but it tolerates well the subtropical conditions with mild winters...", so it is likely the taxon can establish in Cfa and Cwa zones.	1. Cassia bakeriana Craib. Global Biodiversity Information Facility. https://www.gbif.org/species/5357132 (Accessed September 2, 2021) 2. Cassia Bakeriana Craib, Kew Bull.: 45 (1911). Asian Plant. https://asianplant.net/Fabaceae/Cassia_bakeriana.htm (Accessed September 1, 2021). 3. Cunha, L.C.S.; De Morais, S.A.L.; Martins, C.H.G.; Martins, M.M.; Chang, R.; De Aquino, F.J.T.; De Oliveira, A.; Moraes, T.D.S.; Machado, F.C.; Da Silva, C.V.; Do Nascimento, E.A. 2013. Chemical Composition, Cytotoxic and Antimicrobial Activity of Essential Oils from Cassia bakeriana Craib. against Aerobic and Anaerobic Oral Pathogens. Molecules, 18, 4588-4598.
2.04	1. The taxon is present in areas in Southeast Asia with annual precipitation from 40 inches to 120 inches.	1. Cassia bakeriana Craib. Global Biodiversity Information Facility. https://www.gbif.org/species/5357132 (Accessed September 2, 2021)
2.05	1. Native to Thailand. 2. Introduced to West Malaysia and New Guinea for ornamental purposes. 3. Recently introduced to Florida. No evidence of the taxon being repeatedly introduced.	1. Cunha, L.C.S.; De Morais, S.A.L.; Martins, C.H.G.; Martins, M.M.; Chang, R.; De Aquino, F.J.T.; De Oliveira, A.; Moraes, T.D.S.; Machado, F.C.; Da Silva, C.V.; Do Nascimento, E.A. 2013. Chemical Composition, Cytotoxic and Antimicrobial Activity of Essential Oils from Cassia bakeriana Craib. against Aerobic and Anaerobic Oral Pathogens. Molecules, 18, 4588-4598. 2. Cassia Bakeriana Craib, Kew Bull.: 45 (1911). Asian Plant. https://asianplant.net/Fabaceae/Cassia_bakeriana.htm (Accessed September 1, 2021). 3. Caldwell, Doug. 2014. Flowering Trees for Southwest Florida. UF IFAS Extention. http://blogs.ifas.ufl.edu/collierco/files/2018/03/Flowering-Trees-Southwest-Florida.pdf (Accessed September 3, 2021).

3.01	1. Cassia has been reported as a preserved specimen in Brazil. We found no naturally sustaining populations through georeference outside Southeast Asia. 2. "Endemic to Burma and Thailand. Introduced as ornamental in e.g. West Malaysia and New Guinea, also elsewhere, but evidently not common." 3. The taxon is a recent introduction to Florida, but has not naturalized. Geoferences for the plant seem to not be well documented and do not reflect other sources of evidence	1. Cassia bakeriana Craib. Global Biodiversity Information Facility. https://www.gbif.org/species/5357132 (Accessed September 1, 2021). 2. Cassia Bakeriana Craib, Kew Bull.: 45 (1911). Asian Plant. https://asianplant.net/Fabaceae/Cassia_bakeriana.htm (Accessed September 1, 2021). 3. Caldwell, Doug. 2014. Flowering Trees for Southwest Florida. UF IFAS Extention. http://blogs.ifas.ufl.edu/collierco/files/2018/03/Flowering-Trees-Southwest-Florida.pdf (Accessed September 3, 2021).
3.02	No evidence.	0
3.03	No evidence.	0
3.04	No evidence.	0
3.05	1. Cassia bicapsularis " is invasive in parts of Tanzania (Henderson 2002) and Uganda (A.B.R. Witt pers. obs.) and in Kenya (East African Herbarium plants database, 2011) where it has been recorded in the Rift Valley, Nairobi, Western and Nyanza, and Coast floral regions... can invade native vegetation and farmland. It has been listed as a Category 3 invader in South Africa." 2. "Scrambles over and competes with other species. Poisonous to birds and bees."	1. Senna bicapsularis (Rambling Cassia). BioNET-EAFRINET. https://keys.lucidcentral.org/keys/v3/eafrinet/weeds/key/weeds/Media/Html/Senna_bicapsularis_(Rambling_Cassia).htm (Accessed September 2, 2021). 2. Rambling cassia. Invasive Species South Africa. http://invasives.org.za/plants/plants-a-z/item/342-rambling-cassia-senna-bicapsularis (Accessed September 2, 2021).
4.01	No evidence.	0
4.02	No evidence.	0
4.03	No evidence.	0
4.04	1. The genus Cassia was believed to have been grazed by and dispersed by megafauna that is now extinct, but it is unknown if Cassia bakeriana is unpalatable to grazing animals.	1. Rodrigues-Junior, A.G., Santos, M.T.A., Hass, J. et al. (202). What kind of seed dormancy occurs in the legume genus Cassia?. Sci Rep, 10.
4.05	No evidence.	0
4.06	No evidence.	0
4.07	No evidence.	0
4.08	No evidence.	0
4.09	1. Prefers full sun, but tolerates light shade. 2. Full Sun Full Sun to Partial Shade	1. Cassia bakeriana. Missouri Botanical Garden. http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=280525 (Accessed September 1, 2021). 2. National Gardening Plants Database https://garden.org/plants/view/122275/Pink-Shower-Tree-Cassia-bakeriana/ (accessed 9/6/2021)
4.10	1. Grows well in well drained soils. 2. Slightly acid (6.1 – 6.5) Neutral (6.6 – 7.3) Slightly alkaline (7.4 – 7.8)	1. Cassia bakeriana. Missouri Botanical Garden. http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=280525 (Accessed September 1, 2021). 2. National Gardening Plants Database https://garden.org/plants/view/122275/Pink-Shower
4.11	1. Taxon is a small flowering tree with no evidence it grows as a vine or smothers other vegetation.	1. Cassia bakeriana. Missouri Botanical Garden. http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=280525 (Accessed September 1, 2021).
4.12	No evidence.	0
5.01	1. Taxon is a small flowering tree with no evidence it grows submerged or emerged.	1. Cassia bakeriana. Missouri Botanical Garden. http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=280525 (Accessed September 3, 2021).

5.02	1. Fabaceae, not a Poaceae.	1. Cassia bakeriana. Missouri Botanical Garden. http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=280525 (Accessed September 3, 2021).
5.03	1. The taxon is in the Fabaceae family. 2. Nitrogen fixing.	1. Cassia bakeriana. Missouri Botanical Garden. http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=280525 (Accessed September 3, 2021). 2. Cassia bakeriana (pink shower tree). Plant Pono. https://plantpono.org/pono-plants/cassia-bakeriana/ (Accessed September 7, 2021).
5.04	No evidence.	0
6.01	No evidence.	0
6.02	1. Reproduces through seed, but we found no specific information on viablity. 2. Seeds available for sale online	1. Cassia bakeriana. Missouri Botanical Garden. http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=280525 (Accessed September 3, 2021).
6.03	No evidence.	0
6.04	No evidence.	0
6.05	No evidence, cogeners pollinated by carpenter bees	RAo, C. B., Reddi, C. S., Aluri, R. J. S., & Atluri, J. B. (1998). Pollination Ecology of Cassia Ala Ta L.(Caesalpiniaceae). JOURNAL-BOMBAY NATURAL HISTORY SOCIETY, 95, 454-459.
6.06	1. Propagates from cuttings. No evidence of vegetative spread in natural settings	1. Cassia bakeriana. Missouri Botanical Garden. http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=280525 (Accessed September 1, 2021).
6.07	1. Cassia is a tree, that reproduces by seed and cuttings, but we found no evidence on reproduction. 2. Cogener C. fistula is a slow growing, deciduous tree that takes 8-10 years from sowing to flowering. This can be reduced by vegetative propagation.	1. Cassia bakeriana. Missouri Botanical Garden. http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=280525 (Accessed September 1, 2021). 2. Plant Use https://uses.plantnet-project.org/en/Cassia_(PROSEA_Medicinal_plants) (assessed 9/6/2021)
7.01	No evidence.	0
7.02	1. Intentionally planted for ornamental use.	1. Cassia bakeriana. Missouri Botanical Garden. http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=280525 (Accessed September 3, 2021).
7.03	No evidence.	0
7.04	1. Cassia seed are likely too large for wind dispersal.	1. Cassia bakeriana. Missouri Botanical Garden. http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=280525 (Accessed September 2, 2021).
7.05	No evidence the seeds are bouyant or viable in water.	0
7.06	No evidence seeds are eaten by wildlife or remain viable through gut passage.	0
7.07	No evidence of attachment mechanisms.	0
7.08	No evidence seeds are eaten by wildlife or remain viable through gut passage.	0
8.01	1. "Flowers are followed by large bean-like seed pods. Each pod (to 16” long) has 30-40 seeds."	1. Cassia bakeriana. Missouri Botanical Garden. http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=280525 (Accessed September 1, 2021).

8.02	1. Seeds are orthodox and tend to have a long shelf life. 2. Well documented that Cassia species display physical dormancy and To release PY, seeds must experience specific environmental conditions.	1. Ku-Or, Yongkriat & Leksungnoen, Nisa & Onwimon, Damrongvudhi & Doomnil, Peerapat. (2020). Germination and salinity tolerance of seeds of sixteen Fabaceae species in Thailand for reclamation of salt-affected lands. Biodiversitas Journal of Biological Diversity, 21, 2188-2200. 2. Rodrigues-Junior, A. G., Santos, M. T., Hass, J., Paschoal, B. S., & De-Paula, O. C. (2020). What kind of seed dormancy occurs in the legume genus Cassia?. Scientific Reports, 10(1), 1-11.
8.03	No evidence of control. Genus Cassia/Senna--Dig out tap root,Remove flowers, fruit, pods or seeds, SprayStem inject or frill, Cut and paint	1. https://weedsbluemountains.org.au/weeds/cassia/
8.04	No evidence.	0
8.05	No evidence.	0