UF IFAS UNIVERSITY of FLORIDA

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

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Assessment date 1/21/2020 Assessment completed by Petri and Lieurance

	Causonis trifolia (syn: Cayratia trifolia) **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)	1	
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	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	unk	-1
4.05	Toxic to animals	unk	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	unk	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	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	unk	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)	unk	-1
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	y	1
7.04	Propagules adapted to wind dispersal	n	-1
7.05	Propagules water dispersed	y	1
7.06	Propagules bird dispersed	y	1
7.07	Propagules dispersed by other animals (externally)	unk	-1
7.08	Propagules dispersed by other animals (internally)	unk	-1
8.01	Prolific seed production	n	-1
8.02	Evidence that a persistent propagule bank is formed (>1 yr)	unk	-1
8.03	Well controlled by herbicides	unk	1
8.04	Tolerates, or benefits from, mutilation or cultivation	unk	-1
8.05	Effective natural enemies present in U.S.	unk	1
	Total Score	**7**	
	Implemented Pacific Second Screening	**No**	
	Risk Assessment Results	**High Risk**	

section	# questions answered		satisfy minimum?
A		11	yes
B		9	yes
C		14	yes
total	Causonis trifolia (syn: Cayratia trifolia)		yes

	Reference	Source data
1.01	1. van Valkenburg & Bunyapraphatsara 2001, Plant resources of South-East Asia No. 12(2): Medicinal and poisonous plants; https://www.cabi.org/isc/abstract/20013181428 [Accessed 1/30/20] 1. Singapore National Parks Flora and Fauna; https://www.nparks.gov.sg/florafaunaweb/flora/5/1/5148 [Accessed 1/23/20] 1. Australian Tropical Rainforest Plants; http://keys.trin.org.au/key-server/data/0e0f0504-0103-430d-8004-060d07080d04/media/Html/taxon/Cayratia_trifolia.htm [Accessed 1/23/20]	No evidence of domestication or selection of varieties with reduced weed traits 1. However, the wild type has been grown for medicinal purposes, primarily in India
1.02		
1.03		
2.01	1-3. Singapore National Parks Flora and Fauna; https://www.nparks.gov.sg/florafaunaweb/flora/5/1/5148 [Accessed 1/23/20] 2-3. FNAI; https://www.fnai.org/Invasives/Causonis%20trifolia.pdf [Accessed 1/23/20] 4. LawnStarter; https://www.lawnstarter.com/blog/landscaping/koppen-climate-classification-map/ [Accessed 1/23/20]	No computer analysis was performed 1. Native to NE Australia, south Pacific, India, SE Asia, possibly Africa and introduced in Hawaii and Florida (USA) 2. Prefers tropical, sub-tropical, and monsoonal climates 3. Comparing climate zones for these locations suggests suitability in Kopp-Geiger zones Af (tropical rainforest climate), Am (tropical monsoon climate), and Cfa (Humid subtropical climates), which are all zones in Florida 4. Cfa roughly equates to a USDA zone 8a while Am equates to 11a, indicating potential suitability for all USDA zones in Florida
2.02	1. Atlas of Florida Plants; https://florida.plantatlas.usf.edu/Plant.aspx?id=4913 [Accessed 1/23/20] 2. USDA, PLANTS; https://plants.usda.gov/core/profile?symbol=CATR29 [Accessed 1/23/20] 1,3. FNAI; https://www.fnai.org/Invasives/Causonis%20trifolia.pdf [Accessed 1/23/20]	No computer analysis was performed 1. Observed in Florida in 2017 2. Introduced to Hawaii (USA) 3. Native to NE Australia, south Pacific, India, SE Asia, possibly Africa
2.03	1-3. Singapore National Parks Flora and Fauna; https://www.nparks.gov.sg/florafaunaweb/flora/5/1/5148 [Accessed 1/23/20] 2-3. FNAI; https://www.fnai.org/Invasives/Causonis%20trifolia.pdf [Accessed 1/23/20]	No computer analysis was performed 1. Native to NE Australia, south Pacific, India, SE Asia, possibly Africa and introduced in Hawaii and Florida (USA) 2. Prefers tropical, sub-tropical, and monsoonal climates 3. Comparing climate zones for these locations suggests suitability in Kopp-Geiger zones Af (tropical rainforest climate), Am (tropical monsoon climate), and Cfa (Humid subtropical climates)
2.04	1-2. Singapore National Parks Flora and Fauna; https://www.nparks.gov.sg/florafaunaweb/flora/5/1/5148 [Accessed 1/23/20] 1. Meteorological Service Singapore, http://www.weather.gov.sg/climate-climate-of-singapore/ [Accessed 1/23/20] 2. Rainfall Atlas of Hawaii; http://rainfall.geography.hawaii.edu/rainfall.html [Accessed 1/23/20]	1. Native to Singapore where the mean annual precipitation is 85in 2. Introduced in Hawaii where the mean annual rainfall is between 8in to 404in
2.05	1. USDA, PLANTS; https://plants.usda.gov/core/profile?symbol=CATR29 [Accessed 1/23/20] 2. FNAI; https://www.fnai.org/Invasives/Causonis%20trifolia.pdf [Accessed 1/23/20] 2. Atlas of Florida Plants; https://florida.plantatlas.usf.edu/Plant.aspx?id=4913 [Accessed 1/23/20]	1. Introduced to Hawaii (USA) 2. Observed in Florida in 2017 (USA)

3.01	1. USDA, PLANTS; https://plants.usda.gov/core/profile?symbol=CATR29 [Accessed 1/23/20] 1. HEAR, Global Compendium of Weeds; http://www.hear.org/gcw/index.html	1. Introduced species with documented presence as a naturalized weed in Hawaii (USA)
3.02	1. Yeo et al. 2012, Cayratia of Singapore: With a special note on Cayratia japonica; https://lkcnhm.nus.edu.sg/app/uploads/2017/06/2012nis331-338.pdf [Accessed 1/28/20] 2. Kamilya 2008, Survey of weed flora of Atrai river bed in Dakshin-Dinajpur in district of West Bengal, India; http://pleione.ehsst.org/journals/Pleione21/012%20WeedFlora%20of%20Dakshin-Dinajpur%20WBengal.pdf [Accessed 1/24/20] 3. Khan et al. 2018, Rainy season weed species diversity in Aligarh district India; https://pdfs.semanticscholar.org/4f0c/ba8d18be454dbc737daf33a228feffb0a13d.pdf [Accessed 1/24/20] 4. Martin & Chanthy 2007, Weeds of upland crops in Cambodia; http://www.cardi.org.kh/backup/images/stories/Books/PDF/Cambodian_weeds.pdf [Accessed 1/24/20] [Accessed 1/24/20]	1. In Singapore, not recommended for gardening as it does not require intervention to survive and is likely to escape cultivation 2. Included in a list of weed flora of the Atrai river bed in India 3. Documented as a weed found in fields of Saccharum officinarum and Oryza sativa in India (native range) 4. Considered a common weed in Cambodian upland crop fields, but generally found to be intolerant to continuous cultivation
3.03	1. Khan et al. 2018, Rainy season weed species diversity in Aligarh district India; https://pdfs.semanticscholar.org/4f0c/ba8d18be454dbc737daf33a228feffb0a13d.pdf [Accessed 1/24/20] 2. Martin & Chanthy 2007, Weeds of upland crops in Cambodia; http://www.cardi.org.kh/backup/images/stories/Books/PDF/Cambodian_weeds.pdf [Accessed 1/24/20]	No evidence of species rated as a serious or principal weed 1. Documented as a weed found in fields of Saccharum officinarum and Oryza sativa in India (native range) 2. Considered a common weed in Cambodian upland crop fields, but generally found to be intolerant to continuous cultivation
3.04	1. USDA, APHIS, PPQ; https://www.aphis.usda.gov/plant_health/plant_pest_info/weeds/downloads/weedlist.pdf [Accessed 1/24/20] 2. Kamilya 2008, Survey of weed flora of Atrai river bed in Dakshin-Dinajpur in district of West Bengal, India; http://pleione.ehsst.org/journals/Pleione21/012%20WeedFlora%20of%20Dakshin-Dinajpur%20WBengal.pdf [Accessed 1/24/20] 2. Khan et al. 2018, Rainy season weed species diversity in Aligarh district India; https://pdfs.semanticscholar.org/4f0c/ba8d18be454dbc737daf33a228feffb0a13d.pdf [Accessed 1/24/20]	No evidence of species rated as a serious or principal weed 1. Not listed as a noxious weed 2. Considered a weed in native range, so currently considering it a minor weed only
3.05	1. West et al. 2012, Fragment size and planting depth affect the regenerative capacity of bushkiller (Cayratia japonica); https://www.cabi.org/isc/abstract/20133036405 [Accessed 1/24/20] 2. FNAI; https://www.fnai.org/Invasives/Causonis%20trifolia.pdf [Accessed 1/23/20]	1. Cayratia japonica (bushkiller) is a known invader in the USA (AL, CA, LA, MS, NC and TX) 2. This congener has a similar growth structure and was also distributed for use as a medicinal plant
4.01	1. eFloras; http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=242311615 [Accessed 1/23/20] 1. FNAI; https://www.fnai.org/Invasives/Causonis%20trifolia.pdf [Accessed 1/23/20]	1. These features are not in the description of the species
4.02		No evidence
4.03	1. Parasitic Plants Databse; www.omnisterra.com/bot/pp_home.cgi [Accessed 1/25/20]	1. Not listed as being a parasitic plant

4.04	1. Mitra & Mukherjee 2007, Plants used as ethnoveterinary medicine in Uttar and Dakshin Dinajpur districts of West Bengal, India; https://www.researchgate.net/profile/Sobhan_Mukherjee2/publication/270275306_PLANTS_USED_AS_ETHNOVETERINARY_MEDICINE_IN_UTTAR_AND_DAKSHIN_DINAJPUR_DISTRICTS_OF_WEST_BENGAL_INDIA/links/54a8be410cf257a6360be236/PLANTS-USED-AS-ETHNOVETERINARY-MEDICINE-IN-UTTAR-AND-DAKSHIN-DINAJPUR-DISTRICTS-OF-WEST-BENGAL-INDIA.pdf [Accessed 1/27/20]	No evidence 1. Only association of this species with livestock is that leaves have been crushed into a topical spread to heal sores on cattle's neck
4.05	1. Mitra & Mukherjee 2007, Plants used as ethnoveterinary medicine in Uttar and Dakshin Dinajpur districts of West Bengal, India; https://www.researchgate.net/profile/Sobhan_Mukherjee2/publication/270275306_PLANTS_USED_AS_ETHNOVETERINARY_MEDICINE_IN_UTTAR_AND_DAKSHIN_DINAJPUR_DISTRICTS_OF_WEST_BENGAL_INDIA/links/54a8be410cf257a6360be236/PLANTS-USED-AS-ETHNOVETERINARY-MEDICINE-IN-UTTAR-AND-DAKSHIN-DINAJPUR-DISTRICTS-OF-WEST-BENGAL-INDIA.pdf [Accessed 1/27/20]	No evidence 1. Only association of this species with livestock is that leaves have been crushed into a topical spread to heal sores on cattle's neck
4.06	1. USDA, ARS, National Fungus Collections Database; https://nt.ars-grin.gov/fungaldatabases/ [Accessed 1/27/20] 2-3. Gagne et al. 2018, A new pest Asphondylia on grape berries (Vitaceae) in southwestern North America with descriptive notes on the genus; https://bioone.org/journals/Proceedings-of-the-Entomological-Society-of-Washington/volume-120/issue-4/0013-8797.120.4.779/A-New-Pest-Asphondylia-Diptera--Cecidomyiidae-on-Grape-Berries/10.4289/0013-8797.120.4.779.full [Accessed 1/27/20]	1. No records of fungus host 2. Exotic Asphondylia viticola (in mosquito family) forms a stem swelling on Cayratia trifolia, but it is unclear how common this occurrence is or how problematic the species is 3. Of the many exotic species of Asphondylia, only three have been recorded forming associations with plants in the family Vitaceae
4.07	1. Reddy et al. 2007, Traditional knowledge on wild food plants in Andhra Pradesh; http://nopr.niscair.res.in/handle/123456789/910 [Accessed 1/24/20] 1. Singapore National Parks Flora and Fauna; https://www.nparks.gov.sg/florafaunaweb/flora/5/1/5148 [Accessed 1/23/20] 2. Russell-Smith et al. 1997, Aboriginal resource utilization and fire management practice in western Arnhem land, monsoonal northern Australia: Notes for prehistory, lessons for the future; https://link.springer.com/content/pdf/10.1023/A:1021970021670.pdf [Accessed 1/27/20]	1. Young leaves are eaten as a vegetable 2. The fruit and yam of this species are edible to humans
4.08	1. USDA, Forest Service, Fire Effects Information System; https://www.feis-crs.org/feis/faces/ReviewResults.xhtml [Accessed 1/27/20] 2. Shukla 2009, Patterns of plant diversity across Terai landscape in northeastern Uttar Pradesh, India; https://www.researchgate.net/profile/Ravindra_Shukla/publication/252559120_Patterns_of_plant_species_diversity_across_Terai_landscape_in_north-eastern_Uttar_Pradesh_India/links/54520f3d0cf2bf864cbaceec/Patterns-of-plant-species-diversity-across-Terai-landscape-in-north-eastern-Uttar-Pradesh-India.pdf [Accessed 1/27/20]	1. No FEIS species review, indicating a lack of information about impact on fire regimes 2. In India, species is commonly found in forests with frequent fire, but no direct connection between them is made
4.09	1. FNAI; https://www.fnai.org/Invasives/Causonis%20trifolia.pdf [Accessed 1/23/20] 2. Singapore National Parks Flora and Fauna; https://www.nparks.gov.sg/florafaunaweb/flora/5/1/5148 [Accessed 1/23/20]	1. Species prefers full sun

4.10	1. Mat Yazid et al. 2019, Response of Cayratia trifolia towards Pb, NaCl, diesel and wounding stresses through expression of a CtSRG1 gene; https://ukm.pure.elsevier.com/en/publications/response-of-cayratia-trifolia-towards-pb-nacl-diesel-and-wounding [Accessed 1/27/20] 2. Chowdhury et al. 2016, Study of phyto-sociology and ecology of naturally growing Ocimum species with their conservational strategies in Dakshin Dinajpur district of West Bengal; https://reader.elsevier.com/reader/sd/pii/S1872203216300348?token=7B3A704414D2064C71454974DA5DD4F50508908DC1FE6D912BBDB9EE40F138CAD6CCCA0B3D7DEB8EF713D0D0A350B50D [Accessed 1/27/20] 3. Singapore National Parks Flora and Fauna; https://www.nparks.gov.sg/florafaunaweb/flora/5/1/5148 [Accessed 1/23/20]	1. This species continues to survive in soils contaminated by the petroleum industry despite the low soil fertility 2. In India, this species grows in moist soils with a pH of 5.9-6.3 and clay loam texture 3. Can be grown in moist soils, well-drained soils, and fertile loamy soils
4.11	1. USDA, PLANTS; https://plants.usda.gov/core/profile?symbol=CATR29 [Accessed 1/23/20] 1. eFloras; http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=242311615 [Accessed 1/23/20] 2. Jackes 1987, Revision of the Australian Vitaceae, 2. Cayratia; https://www.researchgate.net/publication/285786857_Revision_of_the_Australian_Vitaceae_2_Cayratia_Juss [Accessed 1/24/20]	1. Species is a woody vine (liana) 2. Frequently clinging to trees, but generally considered a weak climber
4.12	1. Singapore National Parks Flora and Fauna; https://www.nparks.gov.sg/florafaunaweb/flora/5/1/5148 [Accessed 1/23/20] 1. eFloras; http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=242311615 [Accessed 1/23/20]	1. No evidence of forming dense thickets, but species is a perennial liana (woody vine) and therefore has potential to obstruct passage
5.01	1. eFloras; http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=242311615 [Accessed 1/23/20] 2. USDA, PLANTS; https://plants.usda.gov/core/profile?symbol=CATR29 [Accessed 1/23/20]	1. Species is a terrestrial woody vine 2. Species is in the family Vitaceae
5.02	1-2. USDA, PLANTS; https://plants.usda.gov/core/profile?symbol=CATR29 [Accessed 1/23/20] 1-2. eFloras; http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=242311615 [Accessed 1/23/20]	1. Species is a liana, or woody vine 2. Species is in the family Vitaceae
5.03	1. USDA, ARS, National Genetic Resources Program, GRIN; https://www.ars-grin.gov/Rhizobium [Accessed 1/21/20] 2. USDA, PLANTS; https://plants.usda.gov/core/profile?symbol=CATR29 [Accessed 1/23/20]	1. Not listed as having an association with rhizobium 2. Species is in the family Vitaceae
5.04	1. Jackes 1987, Revision of the Australian Vitaceae, 2. Cayratia; https://www.researchgate.net/publication/285786857_Revision_of_the_Australian_Vitaceae_2_Cayratia_Juss [Accessed 1/24/20] 1. Swarnkar & Katewa 2008, Ethnobotanical observations on tuberous plants from tribal area of Rajasthan (India); https://opensiuc.lib.siu.edu/cgi/viewcontent.cgi?referer=https://scholar.google.com/&httpsredir=1&article=1122&context=ebl [Accessed 1/24/20] 2. eFloras; http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=242311615 [Accessed 1/28/20]	Conflicting descriptions, not present in photos 1. Species description includes that tubers are present 2. Species description does not include the presence of tubers (similar confusion over presence of tubers in congener C. japonica)

6.01	1. Shukla 2009, Patterns of plant diversity across Terai landscape in northeastern Uttar Pradesh, India; https://www.researchgate.net/profile/Ravindra_Shukla/publication/252559120_Patterns_of_plant_species_diversity_across_Terai_landscape_in_north-eastern_Uttar_Pradesh_India/links/54520f3d0cf2bf864cbaceec/Patterns-of-plant-species-diversity-across-Terai-landscape-in-north-eastern-Uttar-Pradesh-India.pdf [Accessed 1/27/20] 2. Kamilya 2008, Survey of weed flora of Atrai river bed in Dakshin-Dinajpur in district of West Bengal, India; http://pleione.ehsst.org/journals/Pleione21/012%20WeedFlora%20of%20Dakshin-Dinajpur%20WBengal.pdf [Accessed 1/24/20]	1. Species occurred in most of the sampling quadrats laid within the forest vegetation in Uttar Pradesh 2. Included in a list of weed flora of the Atrai river bed in India
6.02	1. Singapore National Parks Flora and Fauna; https://www.nparks.gov.sg/florafaunaweb/flora/5/1/5148 [Accessed 1/23/20] 2. Shukla 2009, Patterns of plant diversity across Terai landscape in northeastern Uttar Pradesh, India; https://www.researchgate.net/profile/Ravindra_Shukla/publication/252559120_Patterns_of_plant_species_diversity_across_Terai_landscape_in_north-eastern_Uttar_Pradesh_India/links/54520f3d0cf2bf864cbaceec/Patterns-of-plant-species-diversity-across-Terai-landscape-in-north-eastern-Uttar-Pradesh-India.pdf [Accessed 1/27/20]	1. Reproduces by seed which take 1-3 months to germinate 2. In native range, species commonly occurs in forest vegetation
6.03	1. Tsukaya et al. 2012, A hypothesis on the origin of genetic heterozygosity in diploids and triploids in Japanese Cayratia japonica species complex; https://link.springer.com/article/10.1007/s10265-011-0467-1 [Accessed 1/27/20]	No evidence of hybridization for this species 1. Japanese populations of congeners C. japonica and C. tenuifolia almost certainly arose from repeated hybridization events, indicating potential of the genus to hybridize naturally
6.04	1. Molina 2009, Floral biology of Philippine morphospecies of the grape relative Leea; https://esj-journals.onlinelibrary.wiley.com/doi/epdf/10.1111/j.1442-1984.2009.00238.x [Accessed 1/27/20]	No direct evidence of self-compatibility 1. Congener C. japonica, like all other Vitaceae, lack a floral tube and this might theoretically predispose these species to self-pollination because the stamens and stigma simultaneously exist in the flower
6.05	1. FNAI; https://www.fnai.org/Invasives/Causonis%20trifolia.pdf [Accessed 1/23/20] 2. Singapore National Parks Flora and Fauna; https://www.nparks.gov.sg/florafaunaweb/flora/5/1/5148 [Accessed 1/23/20]	1. Species pollinated by bees and butterflies
6.06	1. Russell-Smith & Lee 1992, Plant populations and monsoon rain forest in the northern territory, Australia; https://www.jstor.org/stable/pdf/2389010.pdf?refreqid=excelsior%3Afff29c013821b935cd766eb4fb0c4593 [Accessed 1/27/20] 2. Singapore National Parks Flora and Fauna; https://www.nparks.gov.sg/florafaunaweb/flora/5/1/5148 [Accessed 1/23/20]	1. Capable of vegetative reproduction 2. Reproduces from stem cuttings
6.07		No evidence about age of the plant when capable of reproduction
7.01	1. Jackes 1987, Revision of the Australian Vitaceae, 2. Cayratia; https://www.researchgate.net/publication/285786857_Revision_of_the_Australian_Vitaceae_2_Cayratia_Juss [Accessed 1/24/20] 2. Shukla 2009, Patterns of plant diversity across Terai landscape in northeastern Uttar Pradesh, India; https://www.researchgate.net/profile/Ravindra_Shukla/publication/252559120_Patterns_of_plant_species_diversity_across_Terai_landscape_in_north-eastern_Uttar_Pradesh_India/links/54520f3d0cf2bf864cbaceec/Patterns-of-plant-species-diversity-across-Terai-landscape-in-north-eastern-Uttar-Pradesh-India.pdf [Accessed 1/27/20]	No evidence of unintentional dispersal 1. Seeds are 4-6mm by 4-4.5mm in size with two shallow grooves on ventral surface 2. Species commonly found in forests

7.02	1. Nursery Live; https://nurserylive.com/buy-medicinal-plants-online-in-india/cayratia-trifolia-plants-in-india 1. B & T World Seeds; http://b-and-t-world-seeds.com/cartall.asp?species=Cayratia%20trifolia&sref=85554 [Accessed 1/24/20]	1. Commercially available due to medicinal benefits
7.03	1. Khan et al. 2018, Rainy season weed species diversity in Aligarh district India; https://pdfs.semanticscholar.org/4f0c/ba8d18be454dbc737daf33a228feffb0a13d.pdf [Accessed 1/24/20] 2. Martin & Chanthy 2007, Weeds of upland crops in Cambodia; http://www.cardi.org.kh/backup/images/stories/Books/PDF/Cambodian_weeds.pdf [Accessed 1/24/20] [Accessed 1/24/20]	1. Documented as a weed found in fields of Saccharum officinarum and Oryza sativa in India 2. Considered a common weed in Cambodian upland crop fields, but generally found to be intolerant to continuous cultivation
7.04	1. Jackes 1987, Revision of the Australian Vitaceae, 2. Cayratia; https://www.researchgate.net/publication/285786857_Revision_of_the_Australian_Vitaceae_2_Cayratia_Juss [Accessed 1/24/20]	No evidence of wind dispersal or adaptations to facilitate it 1. Seeds described as 4-6mm by 4-4.5mm in size with two shallow grooves on ventral surface
7.05	1. Baird 2007, Fishes and forests: The importance of seasonally flooded riverine habitat for Mekong River fish feeding; https://www.researchgate.net/profile/Ian_Baird/publication/234108643_FISHES_AND_FORESTS_THE_IMPORTANCE_OF_SEASONALLY_FLOODED_RIVERINE_HABITAT_FOR_MEKONG_RIVER_FISH_FEEDING/links/0912f50f3526e5eec3000000.pdf [Accessed 1/27/20] 2. Kamilya 2008, Survey of weed flora of Atrai river bed in Dakshin-Dinajpur in district of West Bengal, India; http://pleione.ehsst.org/journals/Pleione21/012%20WeedFlora%20of%20Dakshin-Dinajpur%20WBengal.pdf [Accessed 1/24/20]	1. In Laos, this species is used in floating fish hooks bc the fleshy fruits are buoyant and attractive to the fish 2. Included in a list of weed flora of the Atrai river bed in India, and the article suggests that many of the plants are dispersed via the river
7.06	1-2. Whittaker & Jones 1994, The role of frugivorous bats and birds in the rebuilding of a tropical forest ecosystem, Krakatau, Indonesia; https://www.jstor.org/stable/pdf/2845528.pdf?refreqid=excelsior%3Af44b5bfd6c692577bd9d15306db9da3f [Accessed 1/27/20] 3. Singapore National Parks Flora and Fauna; https://www.nparks.gov.sg/florafaunaweb/flora/5/1/5148 [Accessed 1/23/20]	1. Pycnonotus aurigaster (Scooty-headed bulbul) and Aplonis panayensis (Asian glossy starling) observed eating fruits of this species in Indonesia 2. Sea-colonist birds observed spreading seeds that were previously moved by the sea or human agencies 2. Fruits are commonly eaten by and seeds dispersed by birds
7.07	1. Jackes 1987, Revision of the Australian Vitaceae, 2. Cayratia; https://www.researchgate.net/publication/285786857_Revision_of_the_Australian_Vitaceae_2_Cayratia_Juss [Accessed 1/24/20] 1. eFloras; http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=242311615 [Accessed 1/23/20]	No evidence 1. Seeds not described as having adaptations making it likely to attach to animals
7.08	1. Baird 2007, Fishes and forests: The importance of seasonally flooded riverine habitat for Mekong River fish feeding; https://www.researchgate.net/profile/Ian_Baird/publication/234108643_FISHES_AND_FORESTS_THE_IMPORTANCE_OF_SEASONALLY_FLOODED_RIVERINE_HABITAT_FOR_MEKONG_RIVER_FISH_FEEDING/links/0912f50f3526e5eec3000000.pdf [Accessed 1/27/20]	1. In Laos, this species is used as bait on fishing lines and the seeds have been found inside the stomach of three different species of fish; the authors suggest the fact that fish might be involved in plant seed dispersal due to their use as bait
8.01	1. Jackes 1987, Revision of the Australian Vitaceae, 2. Cayratia; https://www.researchgate.net/publication/285786857_Revision_of_the_Australian_Vitaceae_2_Cayratia_Juss [Accessed 1/24/20] 2. Russell-Smith & Lee 1992, Plant populations and monsoon rain forest in the northern territory, Australia; https://www.jstor.org/stable/pdf/2389010.pdf?refreqid=excelsior%3Afff29c013821b935cd766eb4fb0c4593 [Accessed 1/27/20] 3. Molina 2009, Floral biology of Philippine morphospecies of the grape relative Leea; https://esj-journals.onlinelibrary.wiley.com/doi/epdf/10.1111/j.1442-1984.2009.00238.x [Accessed 1/27/20] 4. Useful tropical plants; http://tropical.theferns.info/viewtropical.php?id=Cayratia+trifolia [Accessed 1/28/20]	Not enough evidence to evaluate 1. 2 to 4 seeds per fruit 2. 6 to 50 individuals per population in a <2.5ha area 3. On congener C. japonica, less than 30% of the total bud count becomes fruits 4. Hard to estimate the number of fruits per plant, because individuals can be 2 to 20 meters long

8.02	1. Russell-Smith & Lee 1992, Plant populations and monsoon rain forest in the northern territory, Australia; https://www.jstor.org/stable/pdf/2389010.pdf?refreqid=excelsior%3Afff29c013821b935cd766eb4fb0c4593 [Accessed 1/27/20] 2. Singapore National Parks Flora and Fauna; https://www.nparks.gov.sg/florafaunaweb/flora/5/1/5148 [Accessed 1/23/20]	1. Seed dormancy possible for more than 6 months 2. Germination takes 1 to 3 months
8.03	1. Heap 2020, International survey of herbicide resistant weeds; http://www.weedscience.org/ [Accessed 1/23/20] 2. FNAI; https://www.fnai.org/Invasives/Causonis%20trifolia.pdf [Accessed 1/23/20]	1. Not listed as resistant to herbicides 2. No species specific chemical recommendations are available
8.04	1. Martin & Chanthy 2007, Weeds of upland crops in Cambodia; http://www.cardi.org.kh/backup/images/stories/Books/PDF/Cambodian_weeds.pdf [Accessed 1/24/20] [Accessed 1/24/20]	No direct evidence 1. Considered a common weed in Cambodian upland crop fields, but generally found to be intolerant to continuous cultivation
8.05		No evidence of specific, substantially limiting natural enemies