UF IFAS UNIVERSITY of FLORIDA

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

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Assessment date 14 Aprily 2016

| | ***Cryptostegia madagascariensis* 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)<br>North Zone: suited to Zones 8, 9<br>Central Zone: suited to Zones 9, 10<br>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<br>North Zone: mean annual precipitation 50-70 inches<br>Central Zone: mean annual precipitation 40-60 inches<br>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 | 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 | unk | 0 |
| 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 | 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 | y | 1 |
| 5.01 | Aquatic | n | 0 |
| 5.02 | Grass | n | 0 |
| 5.03 | Nitrogen fixing woody plant | unk | 0 |
| 5.04 | Geophyte | n | 0 |

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|---|---|---|---|
| 6.01 | Evidence of substantial reproductive failure in native habitat | n | 0 |
| 6.02 | Produces viable seed | y | 1 |
| 6.03 | Hybridizes naturally | y | 1 |
| 6.04 | Self-compatible or apomictic | unk | -1 |
| 6.05 | Requires specialist pollinators | n | 0 |
| 6.06 | Reproduction by vegetative propagation | unk | -1 |
| 6.07 | Minimum generative time (years) | 1 | 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 | n | -1 |
| 7.04 | Propagules adapted to wind dispersal | y | 1 |
| 7.05 | Propagules water dispersed | y | 1 |
| 7.06 | Propagules bird dispersed | unk | -1 |
| 7.07 | Propagules dispersed by other animals (externally) | y | 1 |
| 7.08 | Propagules dispersed by other animals (internally) | n | -1 |
| 8.01 | Prolific seed production | unk | -1 |
| 8.02 | Evidence that a persistent propagule bank is formed (>1 yr) | n | -1 |
| 8.03 | Well controlled by herbicides | unk | 1 |
| 8.04 | Tolerates, or benefits from, mutilation or cultivation | unk | -1 |
| 8.05 | | ? | |
| | **Total Score** | **16** | |
| | **Implemented Pacific Second Screening** | **No** | |
| | **Risk Assessment Results** | **High** | |

| section | # questions answered | satisfy minimum? |
|---|---|---|
| A | 11 | yes |
| B | 9 | yes |
| C | 16 | yes |
| total | 36 | yes |

| | Reference | Source data |
|---|---|---|
| 1.01 | 1. Queensland Government. Weeds of Australia. http://keyserver.lucidcentral.org/weeds/data/080c0106-040c-4508-8300-0b0a06060e01/media/html/Cryptostegia_madagascariensis.htm (Accessed: 17 March 2016) | 1. Cultivated; but no sign of selection for reduced weediness |
| 1.02 | | Skip to 2.01 |
| 1.03 | | Skip to 2.01 |
| 2.01 | 1. Klackenberg, J. (2001) Revision of the genus Cryptostegia R. Br. (Apocynaceae, Periplocoideae). Adansonia, 2001, Vol. 23, No. 2, pp. 205-218, 20 ref. URL: http://www.mnhn.fr/publication/adanson/a01n2a3.pdf 2. US National Plant Germplasm System. https://npgsweb.ars-grin.gov/gringlobal/taxonomydetail.aspx?12532 (Accessed: 17 March 2016) 3. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 17 March 2016) 4. Encyclopedia of Life. http://eol.org/data_objects/21187349 (Accessed: 17 March 2016) 5. Queensland Government. https://www.business.qld.gov.au/industry/agriculture/species/declared-pests/weeds/purple-rubber-vine (Accessed: 17 March 2015) 6. PERAL NAPPFAST Global Plant Hardiness. http://www.nappfast.org/Plant_hardiness/2012/PHZ%20update201230%20yr%20%20300dpi.tif (Accessed: 10 March 2016) | 1. "Cryptostegia madagascariensis is distributed along the whole of the western part of Madagascar, mostly in western phytogeographical domain but is also found in the Toliara region in southwestern domain." 2. Native to Madagascar and naturalized in Mauritius, Seychelles, India, Florida, Hawaii, Brazil, Dominica, Haiti, Puerto Rico, Guyana, and Venezuela 3. See distribution map 4. See distribution map 5. Naturalized in SE Queensland, Australia 6. Native of naturalized in USDA Hardiness Zones 8-12 |
| 2.02 | | Native range is well known |
| 2.03 | 1. Klackenberg, J. (2001) Revision of the genus Cryptostegia R. Br. (Apocynaceae, Periplocoideae). Adansonia, 2001, Vol. 23, No. 2, pp. 205-218, 20 ref. URL: http://www.mnhn.fr/publication/adanson/a01n2a3.pdf 2. US National Plant Germplasm System. https://npgsweb.ars-grin.gov/gringlobal/taxonomydetail.aspx?12532 (Accessed: 17 March 2016) 3. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 17 March 2016) 4. Encyclopedia of Life. http://eol.org/data_objects/21187349 (Accessed: 17 March 2016) 5. Queensland Government. https://www.business.qld.gov.au/industry/agriculture/species/declared-pests/weeds/purple-rubber-vine (Accessed: 17 March 2015) 6. The University of Melbourne. Köppen-Geiger Climate Map of the Wolrd. http://people.eng.unimelb.edu.au/mpeel/koppen.html (Accessed: 10 March 2016) | 1. " It has been found from sea level up to 700 m alt., usually in full sun. It grows in dry forest (e.g. Didiereaceae, Euphorbia), savannah, tsingy, disturbed grazed grassland, on lateritic soil and sand, often on river beds." 2. Native to Madagascar and naturalized in Mauritius, Seychelles, India, Florida, Hawaii, Brazil, Dominica, Haiti, Puerto Rico, Guyana, and Venezuela 3. See distribution map 4. See distribution map 5. Naturalized in SE Queensland, Australia 6. Native or naturalized in Köppen-Geiger Climate Zones Af, Am, Aw, BWh, BSh, Cwa, Cwb, Cfa, and Cfb |

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|---|---|---|
| 2.04 | 1. Klackenberg, J. (2001) Revision of the genus Cryptostegia R. Br. (Apocynaceae, Periplocoideae). Adansonia, 2001, Vol. 23, No. 2, pp. 205-218, 20 ref. URL: http://www.mnhn.fr/publication/adanson/a01n2a3.pdf 2. US National Plant Germplasm System. https://npgsweb.ars-grin.gov/gringlobal/taxonomydetail.aspx?12532 (Accessed: 17 March 2016) 3. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 17 March 2016) 4. Encyclopedia of Life. http://eol.org/data_objects/21187349 (Accessed: 17 March 2016) 5. Queensland Government. https://www.business.qld.gov.au/industry/agriculture/species/declared-pests/weeds/purple-rubber-vine (Accessed: 17 March 2015) 6. Climate Charts. World Climate Maps. http://www.climate-charts.com/World-Climate-Maps.html#rain (Accessed: 10 March 2016) | 1. "Cryptostegia madagascariensis is distributed along the whole of the western part of Madagascar, mostly in western phytogeographical domain but is also found in the Toliara region in southwestern domain." 2. Native to Madagascar and naturalized in Mauritius, Seychelles, India, Florida, Hawaii, Brazil, Dominica, Haiti, Puerto Rico, Guyana, and Venezuela 3. See distribution map 4. See distribution map 5. Naturalized in SE Queensland, Australia 6. Native or naturalized in areas with rainfall within these ranges |
| 2.05 | 1. USDA, NRCS. 2004. The PLANTS Database, Version 3.5 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA. 2. Hawaii Invasive Species Council. http://dlnr.hawaii.gov/hisc/info/species/rubbervine/ (Accessed: 17 March 2016) 3. Queensland Government. https://www.business.qld.gov.au/industry/agriculture/species/declared-pests/weeds/purple-rubber-vine (Accessed: 17 March 2016) 4. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 17 March 2016) | 1. Florida; Puerto Rico 2. Introduced to Hawaii 3. Naturalized in SE Queensland, Australia 4. Introduced to India, Kenya, Mauritius, Seychelles, Mexico, Florida, Hawaii, Anguilla, Barbados, Belize, British Virgin Islands, Costa Rica, Cuba, Dominican Republic, El Salvador, Grenada, Honduras, Montserrat, Nicaragua, Panama, Puerto Rico, Saint Lucia, US Virgin Islands, Brazil, and Australia |
| 3.01 | 1. Queensland Government. https://www.business.qld.gov.au/industry/agriculture/species/declared-pests/weeds/purple-rubber-vine (Accessed: 17 March 2016) 2. US National Plant Germplasm System. https://npgsweb.ars-grin.gov/gringlobal/taxonomydetail.aspx?12532 (Accessed: 17 March 2016) | 1. Naturalized in NE Queensland, Australia 2. Naturalized in Mauritius, Seychelles, India, Florida, Hawaii, Brazil, Dominica, Haiti, Puerto Rico, Guyana, and Venezuela. |
| 3.02 | 1. HEAR Global Compendium of Weeds. http://www.hear.org/gcw/species/cryptostegia_madagascariensis/ (Accessed: 22 March 2016) 2. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 25 March 2016) | 1. "garden thug" 2. "C. madagascariensis has the ability to quickly spread along water courses, coastal forests, pastures, forest edges, and disturbed areas." |
| 3.03 | 1. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 20 March 2016) | 1. "C. madagascariensis is not a weed of agricultural crops." |
| 3.04 | 1. Randall, R. 2001. Garden thugs, a national list of invasive and potentially 4. Queensland Government. https://www.business.qld.gov.au/industry/agriculture/species/declared-pests/weeds/purple-rubber-vine (Accessed: 20 March 2016) | 1. Environmental weed of Western Australia and Northern Territory 2. Class 3 declared species - sale prohibited by Queensland's Land Protection 3. "Fast growing, climbing plant"; "Grows over other plants and trees to 13 m (45 ft) high, smothering and killing other vegetation" 4. "Threatens waterways and vine forests." |
| 3.05 | 1. Tomley, A. J. (1995) The biology of Australian weeds. 26. Cryptostegia grandiflora R. Br. Plant Protection Quarterly, 1995, Vol. 10, No. 4, pp. 122-130, 50 ref. 2. HEAR Global Compendium of Weeds. http://www.hear.org/gcw/species/cryptostegia_grandiflora/ (Accessed: 22 March 2016) | 1. rubber vine (Cryptostegia grandiflora) is a weed in Australia 2. Cryptostegia grandiflora is classified as an agricultural weed, cultivation escape, environmental weed, garden thug, noxious weed, and weed |
| 4.01 | 1. Klackenberg, J. (2001) Revision of the genus Cryptostegia R. Br. (Apocynaceae, Periplocoideae). Adansonia, 2001, Vol. 23, No. 2, pp. 205-218, 20 ref. URL: http://www.mnhn.fr/publication/adanson/a01n2a3.pdf 2. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 20 March 2016) 3. Global Invasive Species Database. http://www.issg.org/database/species/ecology.asp?si=1628&fr=1&sts=&lang=EN (Accessed: 20 March 2016) | 1,2,&3. no description of these traits |

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|---|---|---|
| 4.02 | | no evidence |
| 4.03 | | no evidence |
| 4.04 | 1. http://www.nrme.qld.gov.au/pests/psas/pdfs/Rubbervine.pdf 2. Hawaii Invasive Species Council. http://dlnr.hawaii.gov/hisc/info/species/rubbervine/ (Accessed: 20 March 2016) | 1. The major impact on primary industry is through the loss of cattle production from infested areas and subsequent control costs. As rubber vine invades open pasture, grass growth decreases as rubber vine cover increases (Vitelli 1995) and the weed utilises soil moisture and this translates directly into a loss of carrying capacity. 2. "Extremely poisonous: it contains cardiac glycosides, which interfere with heart operation in humans and animals when the plant is eaten." |
| 4.05 | 1. http://www.nrme.qld.gov.au/pests/psas/pdfs/Rubbervine.pdf 2. Hawaii Invasive Species Council. http://dlnr.hawaii.gov/hisc/info/species/rubbervine/ (Accessed: 20 March 2016) 3. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 20 March 2016) | 1. Feeding tests have shown the leaves of rubber vine to be toxic to cattle, horses, goats and sheep (McGavin 1969, Everist 1974). Horses are particularly susceptible; toxic effects follow after consumption of only 0.03-0.06% of their body weight (McGavin 1969, Cook et al. 1990). [effects found in feeding trials, not in nature - it seems to be unpalatable under normal conditions, see 4.04] 2. "Extremely poisonous: it contains cardiac glycosides, which interfere with heart operation in humans and animals when the plant is eaten." 3. "Lethal effects on cattle have been reported when they have eaten C. madagascariensis and C. grandiflora in the dry season when proper forage is scarce." |
| 4.06 | 1. Farr, D.F., Rossman, A.Y., Palm, M.E., & McCray, E.B. (n.d.) Fungal Databases, Systematic Botany & Mycology Laboratory, ARS, USDA. Retrieved July 7, 2004, from http://nt.ars-grin.gov/fungaldatabases/ | 1. Acrostalagmus aphidum: Puerto Rico; Virgin Islands [generalist]<br>Hemileia cryptostegiae: Madagascar - [no evidence of economic importance]<br>Maravalia cryptostegiae: Madagascar - [no evidence of economic importance; but was introduced to Australia successfully established to control C. grandiflora; which is a crop in certain regions to harvest its latex for rubber production]<br>Scopella lombiroensis: Madagascar [no evidence of economic importance]; no evidence that this plant is a significant primary or alternate host |
| 4.07 | 1. http://bodd.cf.ac.uk/index.html 2. Klackenberg, J. (2001) Revision of the genus Cryptostegia R. Br. (Apocynaceae, Periplocoideae). Adansonia, 2001, Vol. 23, No. 2, pp. 205-218, 20 ref. URL: http://www.mnhn.fr/publication/adanson/a01n2a3.pdf 3. http://www.allergenica.com/Details.asp?PLANTID=52 4. Hawaii Invasive Species Council. http://dlnr.hawaii.gov/hisc/info/species/rubbervine/ (Accessed: 20 March 2016) 5. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 20 March 2016) | 1. "Contact with all parts of the plant can cause dermatitis (Hardin and Arena 1974)." 2. Its poisonous properties have sometimes been utilised forcommitting suicide for religious reasons 3. The milky sap of this ornamental vine causes a severe dermatitis. If the dust of dried parts is inhaled, irritation to the eyes, nose and throat can occur accompanied by swelling. 4. "Extremely poisonous: it contains cardiac glycosides, which interfere with heart operation in humans and animals when the plant is eaten."; "When the vine is dry, a powdery dust emerges and can cause violent coughing, swelling of the nose, and blistering of the eyelids."; "Contact with the plant's milky sap can cause burning rashes and blisters." 5. "Causes allergic responses" |
| 4.08 | | no evidence |
| 4.09 | 1. Klackenberg, J. (2001) Revision of the genus Cryptostegia R. Br. (Apocynaceae, Periplocoideae). Adansonia, 2001, Vol. 23, No. 2, pp. 205-218, 20 ref. URL: http://www.mnhn.fr/publication/adanson/a01n2a3.pdf 2. Top Tropicals. https://toptropicals.com/catalog/uid/Cryptostegia_madagascariensis.htm (Accessed: 25 March 2016) | 1. "It has been found from sea level up to 700 m alt., usually in full sun. It grows in dry forest (e.g. Didiereaceae, Euphorbia), savannah, tsingy, disturbed grazed grassland, on lateritic soil and sand, often on river beds." [probably not, only found in places with ample sun exposure] 2. Full sun or semi shade |

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|---|---|---|
| 4.10 | 1. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 5 April 2016) 2. Top Tropicals. https://toptropicals.com/catalog/uid/Cryptostegia_madagascariensis.htm (Accessed: April 2016) | 1. "It is also tolerant of a wide variety of soil types.", "Soil tolerances- Soil drainage (free, seasonally waterlogged), Soil reaction (acid, alkaline, neutral), Soil texture (heavy, light, medium), Special soil tolerances (saline, shallow) 2. "Cryptostegias need a tropical, humid atmosphere and well-drained, loamy soil that is always fairly moist."; insufficient information |
| 4.11 | 1. Klackenberg, J. (2001) Revision of the genus Cryptostegia R. Br. (Apocynaceae, Periplocoideae). Adansonia, 2001, Vol. 23, No. 2, pp. 205-218, 20 ref. URL: http://www.mnhn.fr/publication/adanson/a01n2a3.pdf 2. Hawaii Invasive Species Council. http://dlnr.hawaii.gov/hisc/info/species/rubbervine/ (Accessed: 20 March 2016) 3. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 20 March 2016) 4. Global Invasive Species Database. http://www.issg.org/database/species/ecology.asp?si=1628&fr=1&sts=&lang=EN (Accessed: 20 March 2016) | 1. "Woody liana to shrub with scrambling branches, usually 2-3 m high and self-supporting but sometimes climbing up to 10 m high" 2. "Fast growing, climbing plant"; "Grows over other plants and trees to 13 m (45 ft) high, smothering and killing other vegetation" 3. "The plant can form dense impenetrable thickets by climbing up trees and covering them" 4. "Organism type: vine, climber" |
| 4.12 | 1. http://www.nrme.qld.gov.au/pests/psas/pdfs/Rubbervine.pdf 2. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 20 March 2016) | 1. impedes access of stock to water and hinders mustering. [grandiflora; don't know if madagascariensis does the same] 2. " The plant can form dense impenetrable thickets by climbing up trees and covering them"; "C. madagascariensis can form dense monospecific thickets that can out-compete native vegetation" |
| 5.01 | 1. Island Biodiversity and Invasive Species. http://ibis.fos.auckland.ac.nz/page/species-information.aspx?speciesid=25183 (Accessed: 20 March 2016) | 1. "Environment/System: Terrestrial" |
| 5.02 | 1. Klackenberg, J. (2001) Revision of the genus Cryptostegia R. Br. (Apocynaceae, Periplocoideae). Adansonia, 2001, Vol. 23, No. 2, pp. 205-218, 20 ref. URL: http://www.mnhn.fr/publication/adanson/a01n2a3.pdf 2. USDA Plants Database. http://plants.usda.gov/core/profile?symbol=crma10 (Accessed: 20 March 2016) | 1. "Woody liana to shrub with scrambling branches, usually 2-3 m high and self-supporting but sometimes climbing up to 10 m high" 2. "Growth Habit: Vine" |
| 5.03 | 1. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 20 March 2016) | 1. "Woody"; no evidence of nitrogen fixation |
| 5.04 | 1. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 20 March 2016) 2. Global Invasive Species Database. http://www.issg.org/database/species/ecology.asp?si=1628&fr=1&sts=&lang=EN (Accessed: 20 March 2016) | 1&2. no evidence of these specialized structures |
| 6.01 | | no evidence |
| 6.02 | 1. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 20 March 2016) 2. Global Invasive Species Database. http://www.issg.org/database/species/ecology.asp?si=1628&fr=1&sts=&lang=EN (Accessed: 20 March 2016) | 1. "Seed propagated" 2. "Each fruit averages around 96.5 seeds. Seeds from closed fruit showed 93% germination under those conditions" |
| 6.03 | 1. http://www.hear.org/starr/hiplants/reports/html/cryptostegia_spp.htm 2. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 20 March 2016) | 1. AB: The genus Cryptostegia R. Br. comprises two species, both of which are endemic to Madagascar. One species, C. grandiflora Roxb. ex R. Br., is widely naturalised in tropical regions of the world. The other species, C. madagascariensis Bojer ex Decne., comprises three varieties, of which C. madagascariensis var. glaberrima (Hochreutiner) J. Marohasy and P. Forster is a new combination [.tbd. C. glaberrima] and C. madagascariensis var. septentrionalis J. Marohasy and P. Forster is newly described. Interspecific hybrids occur in a narrow zone where the two species are sympatric. 2. "Hybrids of these two species with intermediate floral and vegetative morphology have been identified in Madagascar" |

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| 6.04 | 1. http://www.nrme.qld.gov.au/pests/psas/pdfs/Rubbervine.pdf 2. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 20 March 2016) | 1. Rubber vine is insect pollinated but in Queensland pollination has not been observed, although viable seed is produced (Tomley 1995a). [chracteristics of C. grandiflora] 2. "C. madagascariensis is a self-compatible species, but spontaneous self-pollination does not occur due to morphological characteristics" |
| 6.05 | 1. http://www.uni-bayreuth.de/departments/planta2/research_wgl/pollina/as_pol_d.html 2. http://www.nrme.qld.gov.au/pests/psas/pdfs/Rubbervine.pdf 3. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 20 March 2016) | 1. Xylocopa spp. (carpenter bees); Batocnema coquereli (hawkmoth); Madagascar Hippotion saclavorum (hawkmoth); Nephele comma (hawkmoth) [1 carpenter bee and 3 hawkmoths were recorded as pollinators] 2. flower structure restricts the suite of available pollinators 3. "Flowers are insect-pollinated, visited mainly by bees." |
| 6.06 | | no evidence |
| 6.07 | 1. http://www.hear.org/starr/hiplants/reports/html/cryptostegia_spp.htm 2. http://www.nrme.qld.gov.au/pests/psas/pdfs/Rubbervine.pdf 3. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 20 March 2016) | 1. "Plants can begin to reproduce (flowering) after about 200 days and seeds remain viable for approximately 12 months (Russell 2001)." [description of Cryptostegia species as a whole] 2. In Haiti, plants have been shown to flower at 5 to 7 months of age, when supplied with continuous water and grown as a commercial rubber crop (Symontowne 1943). Curtis (1946) recorded plant flowering 3 months after transplanting grafts in Haiti. First flowering under Queensland conditions (Charters Towers) can be within 250 days of germination with good rain on a sandy alluvial or heavy clay loam soil (Fig. 5) but is more usually 400-450 days after germination irrespective of soil type. (Curtis (1946) found the average time for fruit development from flowers to ripeopen fruit was 173 days. [description of Cryptostegia grandiflora] 3. "Plants can begin to reproduce after about 200 days" |
| 7.01 | 1. Queensland Government. .https://www.business.qld.gov.au/industry/agriculture/species/declared-pests/weeds/purple-rubber-vine (Accessed: 20 March 2016) 2. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 20 March 2016) | 1. "Spread mainly by wind-dispersed seeds, water, and dumping of garden waste." 2. "Clothing/footwear and possessions" |
| 7.02 | 1. http://www.hear.org/starr/hiplants/reports/html/cryptostegia_spp.htm 2. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 20 March 2016) | 1. "C. grandiflora and C. madagascariensis, are widely cultivated" 2. "C. madagascariensis has been planted as an ornamental and it is still sold in the nursery and landscape trade."; "C. madagascariensis is available to the public through internet sites (i.e., garden and landscape companies online) and few of them describe the invasive capacity of this species." |
| 7.03 | | no evidence |
| 7.04 | 1. Klackenberg, J. (2001) Revision of the genus Cryptostegia R. Br. (Apocynaceae, Periplocoideae). Adansonia, 2001, Vol. 23, No. 2, pp. 205-218, 20 ref. URL: http://www.mnhn.fr/publication/adanson/a01n2a3.pdf 2. http://www.hear.org/starr/hiplants/reports/html/cryptostegia_spp.htm 3. Hawaii Invasive Species Council. http://dlnr.hawaii.gov/hisc/info/species/rubbervine/ (Accessed: 20 March 2016) 4. Queensland Government. .https://www.business.qld.gov.au/industry/agriculture/species/declared-pests/weeds/purple-rubber-vine (Accessed: 20 March 2016) | 1. "Follicles (5-)7-9 × 1-3 cm, glabrous to finely pubescent. Seeds 5-8 mm long; hairs 2-3 cm long. 2. "Numerous seed with tufts of silky hairs help disperse the seeds in the wind. 3. "Each seedpod contains 340-840 seeds, silky hairs on seeds allow them to spread by wind and water, seeds are also known to float and survive for a month in salt water before being washed ashore to sprout." 4. "Spread mainly by wind-dispersed seeds, water, and dumping of garden waste." |

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| 7.05 | 1. http://www.hear.org/starr/hiplants/reports/html/cryptostegia_spp.htm 2. Klackenberg, J. (2001) Revision of the genus Cryptostegia R. Br. (Apocynaceae, Periplocoideae). Adansonia, 2001, Vol. 23, No. 2, pp. 205-218, 20 ref. URL: http://www.mnhn.fr/publication/adanson/a01n2a3.pdf 3. Hawaii Invasive Species Council. http://dlnr.hawaii.gov/hisc/info/species/rubbervine/ (Accessed: 20 March 2016) 4. Queensland Government. .https://www.business.qld.gov.au/industry/agriculture/species/declared-pests/weeds/purple-rubber-vine (Accessed: 20 March 2016) | 1. Numerous seed with tufts of silky hairs help disperse the seeds in the wind. 2. often on river beds [habitat provides opportunity for floating seeds] 3. "Each seedpod contains 340-840 seeds, silky hairs on seeds allow them to spread by wind and water, seeds are also known to float and survive for a month in salt water before being washed ashore to sprout." 4. "Spread mainly by wind-dispersed seeds, water, and dumping of garden waste." |
| 7.06 | | no evidence, but unlikely due to toxic properties |
| 7.07 | 1. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 20 March 2016) | 1. "they can produce large amount of seeds which are rapidly dispersed by wind, floodwaters, or stuck to the fur of animals" |
| 7.08 | | no evidence of ingestion |
| 8.01 | 1. http://www.nrme.qld.gov.au/pests/psas/pdfs/Rubbervine.pdf 2. Klackenberg, J. (2001) Revision of the genus Cryptostegia R. Br. (Apocynaceae, Periplocoideae). Adansonia, 2001, Vol. 23, No. 2, pp. 205-218, 20 ref. URL: http://www.mnhn.fr/publication/adanson/a01n2a3.pdf 3. Hawaii Invasive Species Council. http://dlnr.hawaii.gov/hisc/info/species/rubbervine/ (Accessed: 20 March 2016) 4. Queensland Government. https://www.business.qld.gov.au/industry/agriculture/species/declared-pests/weeds/purple-rubber-vine (Accessed: 20 March 2016) | 1. Curtis (1946) also found of 1100 plants per hectare produced 15 fruits per plant per annum [1.65 fruit per square meter], while densities of 12000-29000 plants per hectare produced an average of 1 fruit per plant per annum [0.34- 0.83 fruits per square meter]. Curtis (1946) found the average time for fruit development from flowers to ripe open fruit was 173 days. The average seed weight was 9 mg with 668 seeds per fruit while 340-840 seeds per fruit have been recorded in Charters Towers (Vitelli 1987 unpublished report). A study in Haiti demonstrated that 3000 grafted Cryptostegia grandiflora plants per acre produced 8,061,000 flowers per acre per year and 182,700 fruit per acre per year (a flower to fruit ratio of 44:1) but in Queensland the flower to fruit ratio varies between around 6 to 150:1 depending on rainfall and soil type [description of C. grandiflora, 116 to 1386 seeds per square meter]<br>2. "Follicles (5-)7-9 × 1-3 cm, glabrous to finely pubescent. Seeds 5-8 mm long; hairs 2-3 cm long."the rubber vine density [have smaller fruit 8-13.5 × 2-3.5 cm and similar-sized seeds comparing to C. grandiflora] [0.5-1.65 fruits per square meter with 340-840 seeds per fruit = less than 1000 seeds in most cases] 3. "Each seedpod contains 340-840 seeds" 4. "Pods are 7-9cm long, contain seeds 5.-5.9mm long, 1.8-3.5mm wide, topped with silky tuft of white hairs." |
| 8.02 | 1. Bebawi, F. F. , Campbell, S. D. , Lindsay, A. M. (2003) Effects of burial and age on viability of rubber vine (Cryptostegia grandiflora) seeds. Plant Protection Quarterly, 2003, Vol. 18, No. 4, pp. 147-151, 13 ref. 2. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 20 March 2016) | 1. AB: "In the field, the most rapid decline in viability occurred under natural rainfall conditions, i.e. with no viable rubber vine seeds remaining in the soil seed bank after one year, irrespective of the burial depth. In contrast, viability of seed lots under conditions where rainfall was excluded averaged 68, 29 and 0% after 1, 2 and 3 years, respectively. Under dry storage, viability of 1-year-old seed was extremely high (99%) and not significantly different to that of freshly collected seed. In comparison, viability of 9- and 11-year-old seeds averaged 87%, and only 20% of 20-year-old seeds remained viable. Almost all viable seeds had sufficient vigour to develop into seedlings, irrespective of their age."<br>[description of a congeneric species, C. grandiflora. Probably no; seed viability decline rapidly in field condition] 2. "Seeds can remain viable up to one year" |

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| 8.03 | 1. Vitelli, J. S. , Mayer, R. J. , Jeffrey, P. L. (1994) Foliar application of 2,4-D/picloram, imazapyr, metsulfuron, triclopyr/picloram, and dicamba kills individual rubber vine (Cryptostegia grandiflora) plants. Tropical Grasslands, 1994, Vol. 28, No. 2, pp. 120-126, 20 ref.<br>2. http://www.hear.org/starr/hiplants/reports/pdf/cryptostegia_spp.pdf<br>3. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 20 March 2016) | 1. Probably yes, several herbicides successfully control rubber vine (C. grandiflora, an invasive congeneric species)<br>2. Chemical control: A variety of chemicals listed by Australia includes: Grazon DS, Banvel, Brushoff, Tordon, Velpar, Graslan, and 2, 4-D. In Hawai'i, Garlon has be used in cut stump treatments as well as mechanical removal. 3. "A variety of chemicals listed in Australia to control Cryptostegia species includes: triclopyr butoxyethyl ester, dimethylamine salt of dicamba (3,6-dichloro-o-anisic acid), 4-amino-3,5,6-trichloropicolinic acid, and 3,5,6-trichloro-2-pyridinyloxy- acetic acid. These herbicides are effective when they are applied directly to roots, leaves, and cut stumps (Starr et al., 2003)." |
| 8.04 | 1. Klackenberg, J. (2001) Revision of the genus Cryptostegia R. Br. (Apocynaceae, Periplocoideae). Adansonia, 2001, Vol. 23, No. 2, pp. 205-218, 20 ref. URL: http://www.mnhn.fr/publication/adanson/a01n2a3.pdf<br>2. Grice, A. C. (1997) Post-fire regrowth and survival of the invasive tropical shrubs Cryptostegia grandiflora and Ziziphus mauritiana. Australian Journal of Ecology, 1997, Vol. 22, No. 1, pp. 49-55, 19 ref. 3. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 20 March 2016) | 1. "Exotic shrubs are significant invaders of the tropical woodlands of northern Australia. They cause problems for pastoral industries and are likely to induce significant change in woodland communities. A single fire in the middle of the dry season affected the survival and vegetative growth of two important shrub species, Cryptostegia grandiflora and Ziziphus mauritiana, at a site in Queensland. The fire killed about 96% of small plants (height < 100 cm), 80% of medium-sized plants and 45% of large plants (height > 200 cm) of C. grandiflora. However, only about 10% of small Z. mauritiana were killed. Most plants of Z. mauritiana resprouted vigorously within three months of the fire. Effects on the vegetative phenology of C. grandiflora persisted until 10 months after the fire, but by four months after the fire, burnt and unburnt Z. mauritiana were similar as regards the distribution of individuals between phenological categories. Changed fireregimes may partially explain the colonization of northern and northeastern Queensland by C. grandiflora but probably had little effect on Z. mauritiana. Fire has significant potential as a tool in the management of C. grandiflora wherever adequate grass fuel can be attained. The use of fire will be particularly valuable for preventing range expansion, for situations where the species is in the early stages of invasion and in parts of the landscape where densities are relatively low."; " It has been found from sea level up to 700 m alt., usually in full sun. It grows in dry forest (e.g. Didiereaceae, Euphorbia), savannah, tsingy, disturbed grazed grassland, on lateritic soil and sand, often on river beds." [probabaly yes, grow in dry, fire-prone habitats]<br>2. AB: " Exotic shrubs are significant invaders of the tropical woodlands of northern Australia. They cause problems for pastoral industries and are likely to induce significant change in woodland communities. A single fire in the middle of the dry season affected the survival and vegetative growth of two important shrub species, Cryptostegia grandiflora and Ziziphus mauritiana, at a site in Queensland. The fire killed about 96% of small plants (height < 100 cm), 80% of medium-sized plants and |

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| 8.05 | 1. http://www.hear.org/starr/hiplants/reports/html/cryptostegia_spp.htm 2. Queensland Government. https://www.business.qld.gov.au/industry/agriculture/species/declared-pests/weeds/purple-rubber-vine (Accessed: 20 March 2016) 3. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/113682 (Accessed: 20 March 2016) | 1. Biological control: No biological controls have been introduced yet to Hawai'i. 2. "No known biological control agents." 3. "In Australia, biological control has been used in both the species C. grandiflora and C. madagascariensis. The rubber vine rust (Maravalia cryptostegiae) has been used for biological control over a wide area in Queensland. Yellow spores form under leaves eventually causing defoliation, reducing seed production, causing dieback of stems, and killing young seedlings. In addition the larvae of the moth Euclasta whalleyi have been used in combination with the rust. This larvae feed on leaves. These agents do not kill established plants, but do cause abnormal defoliation and lead to reduced seed production. Their success and potential damage depends on their abundance (Starr et al., 2003). In Brazil, two fungal pathogens Colletotrichum gloeosporioides (Glomerella cingulata) and Pseudocercospora cryptostegiae-madagascariensis have been targeted as potential biological control agents (Silva et al., 2008). " |