Family: ***Sapindaceae***

Taxon: ***Cupaniopsis anacardioides***

Synonym: *Cupania anacardioides A. Rich. (basionym)* ***Common Name:*** carrotwood
tuckeroo

Questionaire : current 20090513 **Assessor:** Patti Clifford **Designation:** H(HPWRA)
Status: Assessor Approved **Data Entry Person:** Patti Clifford **WRA Score 9**

101	**Is the species highly domesticated?**	**y=-3, n=0**	**n**
102	**Has the species become naturalized where grown?**	**y=1, n=-1**	
103	**Does the species have weedy races?**	**y=1, n=-1**	
201	**Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"**	**(0-low; 1-intermediate; 2-high) (See Appendix 2)**	**High**
202	**Quality of climate match data**	**(0-low; 1-intermediate; 2-high) (See Appendix 2)**	**High**
203	**Broad climate suitability (environmental versatility)**	**y=1, n=0**	**n**
204	**Native or naturalized in regions with tropical or subtropical climates**	**y=1, n=0**	**y**
205	**Does the species have a history of repeated introductions outside its natural range?**	**y=-2, ?=-1, n=0**	**y**
301	**Naturalized beyond native range**	**y = 1*multiplier (see Appendix 2), n= question 205**	**y**
302	**Garden/amenity/disturbance weed**	**n=0, y = 1*multiplier (see Appendix 2)**	**n**
303	**Agricultural/forestry/horticultural weed**	**n=0, y = 2*multiplier (see Appendix 2)**	**n**
304	**Environmental weed**	**n=0, y = 2*multiplier (see Appendix 2)**	**y**
305	**Congeneric weed**	**n=0, y = 1*multiplier (see Appendix 2)**	**n**
401	**Produces spines, thorns or burrs**	**y=1, n=0**	**n**
402	**Allelopathic**	**y=1, n=0**	
403	**Parasitic**	**y=1, n=0**	**n**
404	**Unpalatable to grazing animals**	**y=1, n=-1**	
405	**Toxic to animals**	**y=1, n=0**	**n**
406	**Host for recognized pests and pathogens**	**y=1, n=0**	**n**
407	**Causes allergies or is otherwise toxic to humans**	**y=1, n=0**	**n**
408	**Creates a fire hazard in natural ecosystems**	**y=1, n=0**	**n**
409	**Is a shade tolerant plant at some stage of its life cycle**	**y=1, n=0**	
410	**Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)**	**y=1, n=0**	**y**
411	**Climbing or smothering growth habit**	**y=1, n=0**	**n**

412	**Forms dense thickets**	**y=1, n=0**	**y**
501	**Aquatic**	**y=5, n=0**	**n**
502	**Grass**	**y=1, n=0**	**n**
503	**Nitrogen fixing woody plant**	**y=1, n=0**	
504	**Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)**	**y=1, n=0**	**n**
601	**Evidence of substantial reproductive failure in native habitat**	**y=1, n=0**	**n**
602	**Produces viable seed**	**y=1, n=-1**	**y**
603	**Hybridizes naturally**	**y=1, n=-1**	
604	**Self-compatible or apomictic**	**y=1, n=-1**	
605	**Requires specialist pollinators**	**y=-1, n=0**	**n**
606	**Reproduction by vegetative fragmentation**	**y=1, n=-1**	**n**
607	**Minimum generative time (years)**	**1 year = 1, 2 or 3 years = 0, 4+ years = -1**	
701	**Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)**	**y=1, n=-1**	**n**
702	**Propagules dispersed intentionally by people**	**y=1, n=-1**	**y**
703	**Propagules likely to disperse as a produce contaminant**	**y=1, n=-1**	**n**
704	**Propagules adapted to wind dispersal**	**y=1, n=-1**	**n**
705	**Propagules water dispersed**	**y=1, n=-1**	**y**
706	**Propagules bird dispersed**	**y=1, n=-1**	**y**
707	**Propagules dispersed by other animals (externally)**	**y=1, n=-1**	**n**
708	**Propagules survive passage through the gut**	**y=1, n=-1**	**y**
801	**Prolific seed production (>1000/m2)**	**y=1, n=-1**	**y**
802	**Evidence that a persistent propagule bank is formed (>1 yr)**	**y=1, n=-1**	**n**
803	**Well controlled by herbicides**	**y=-1, n=1**	**y**
804	**Tolerates, or benefits from, mutilation, cultivation, or fire**	**y=1, n=-1**	**y**
805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	**y=-1, n=1**	

Designation: H(HPWRA) **WRA Score** **9**

Supporting Data:

101	2010. WRA Specialist. Personal Communication.	No evidence of domestication to reduce invasiveness.
102	2010. WRA Specialist. Personal Communication.	N/A
103	2010. WRA Specialist. Personal Communication.	N/A
201	2011. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Online Database Index]. National Germplasm Resources Laboratory, Beltsville, Maryland. http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	Native range: Indonesia - Irian Jaya; Papua New Guinea; Australia - New South Wales, Northern Territory, Queensland, Western Australia.
202	2011. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Online Database Index]. National Germplasm Resources Laboratory, Beltsville, Maryland. http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	Native range: Indonesia - Irian Jaya; Papua New Guinea; Australia - New South Wales, Northern Territory, Queensland, Western Australia.
203	2007. Materson, J.. Cupaniopsis anacardioides (carrotwood). Smithsonian Marine Stations, Fort Pierce http://www.sms.si.edu/irlspec/cupaniopsis_anacardioides.htm	"Temperature is likely the key factor limiting the spread of Cupaniopsis anacardioides into north Florida. A temperature of -6°C has been published as a lethal lower limit for the species, although test specimens maintained in north Florida have survived winter temperatures as low or lower than this value (Lockhart 2006). "
204	2011. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Online Database Index]. National Germplasm Resources Laboratory, Beltsville, Maryland. http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	Native range: Indonesia - Irian Jaya; Papua New Guinea; Australia - New South Wales, Northern Territory, Queensland, Western Australia.
205	2005. Lockhart, C.. PCA fact sheet: carrotwood Cupaniopsis anacardioides. Plant Conservation Alliance®s Alien Plant Working Group, http://www.nps.gov/plants/alien/fact/cuan1.htm	"University of Florida Herbarium specimens document carrotwood cultivation as early as 1955 in eastern Florida. A separate introduction in Sarasota, Florida in 1968 resulted in large scale propagation and use as an ornamental tree. Carrotwood became a popular landscape tree throughout southern Florida in the late 1970s and early 1980s. By 1990, wild carrotwood seedlings began to be seen in the wild in various habitats. Carrotwood has also been used ornamentally in California, but there are no reports of naturalized populations there, perhaps due to their drier climate."
205	2005. Staples, G. W./Herbst, D. R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI.	Rarely cultivated in Hawaii
301	2007. Materson, J.. Cupaniopsis anacardioides (carrotwood). Smithsonian Marine Stations, Fort Pierce http://www.sms.si.edu/irlspec/cupaniopsis_anacardioides.htm	"In Florida, carrotwood can be found in coastal lands and estuarine margins and riparian zones, and within disturbed wetlands. Carrotwood can be found in all six IRL watershed counties and is considered to be naturalized from at least Brevard County southward. "
302	2010. WRA Specialist. Personal Communication.	See 3.04.
303	2007. Randall, R.P.. Global Compendium of Weeds [Online Database]. http://www.hear.org/gcw/	No evidence.
304	2007. Materson, J.. Cupaniopsis anacardioides (carrotwood). Smithsonian Marine Stations, Fort Pierce http://www.sms.si.edu/irlspec/cupaniopsis_anacardioides.htm	"Carrotwood occurs in at least 14 Florida counties and is capable of displacing native plants to form monotypic stands. Lockhart et al. (1999) report carrotwood densities are highest in mangrove and coastal hammock habitats, reaching greater than 24 plants per square meter and 21 plants per square meter, respectively. "
305	2007. Randall, R.P.. Global Compendium of Weeds [Online Database]. http://www.hear.org/gcw/	No evidence.

401	2010. Abdulla, P.. Flora of Pakistan Cupaniopsis anacardioides (A. Rich.) Radlk. in Sitzungsber. bayer. Akad. 9: 1530. 1879. et Pflanzenr. Sapind. 1186. 1933.. www.efloras.org, http://www.efloras.org/florataxon.aspx?flora_id=5&taxon_id=250063394	No spines, thorns, burrs.
402	2010. WRA Specialist. Personal Communication.	Unknown
403	2010. Abdulla, P.. Flora of Pakistan Cupaniopsis anacardioides (A. Rich.) Radlk. in Sitzungsber. bayer. Akad. 9: 1530. 1879. et Pflanzenr. Sapind. 1186. 1933.. www.efloras.org, http://www.efloras.org/florataxon.aspx?flora_id=5&taxon_id=250063394	Sapindaceae.
404	2010. WRA Specialist. Personal Communication.	Unknown.
405	2010. National Center for Biotechnology Information. PubMed. U.S. National Library of Medicine, Bethesda, Maryland http://www.ncbi.nlm.nih.gov/sites/entrez	No evidence of toxicity to animals.
405	2010. Specialized Information Services, U.S. National Library of Medicine. TOXNET Toxicology Data Network [Online Database]. National Institutes of Health, http://toxnet.nlm.nih.gov/	No evidence of toxicity to animals.
406	2007. Gilman, E.F./Watson, D.G.. Cupaniopsis anacardiopsis: carrotwood. http://edis.ifas.ufl.edu/pdffiles/ST/ST22100.pdf	No pests or diseases are of major concern.
407	2010. National Center for Biotechnology Information. PubMed. U.S. National Library of Medicine, Bethesda, Maryland http://www.ncbi.nlm.nih.gov/sites/entrez	No evidence of toxicity.
407	2010. Specialized Information Services, U.S. National Library of Medicine. TOXNET Toxicology Data Network [Online Database]. National Institutes of Health, http://toxnet.nlm.nih.gov/	No evidence of toxicity.
408	2005. Lockhart, C.. PCA fact sheet: carrotwood Cupaniopsis anacardioides. Plant Conservation Alliance®s Alien Plant Working Group, http://www.nps.gov/plants/alien/fact/cuan1.htm	[Unlikely] "While carrotwood invades a variety of natural communities, including dunes, coastal strand, sand pine scrub, slash pine flatwoods, cypress swamps, freshwater marshes and river banks, it poses a special threat to coastal ecosystems like mangrove swamps and tropical hammocks."
409	2005. Lockhart, C.. PCA fact sheet: carrotwood Cupaniopsis anacardioides. Plant Conservation Alliance®s Alien Plant Working Group, http://www.nps.gov/plants/alien/fact/cuan1.htm	Tolerant of shade and sun.
409	2007. Gilman, E.F./Watson, D.G.. Cupaniopsis anacardiopsis: carrotwood. http://edis.ifas.ufl.edu/pdffiles/ST/ST22100.pdf	Full sun.
410	2005. Lockhart, C.. PCA fact sheet: carrotwood Cupaniopsis anacardioides. Plant Conservation Alliance®s Alien Plant Working Group, http://www.nps.gov/plants/alien/fact/cuan1.htm	Tolerant of salt, poor soils, poor drainage.
410	2007. Materson, J.. Cupaniopsis anacardioides (carrotwood). Smithsonian Marine Stations, Fort Pierce http://www.sms.si.edu/irlspec/cupaniopsis_anacardioides.htm	"Carrotwood is tolerant of a wide range of soil moisture conditions and thrives in disturbed and undisturbed wetlands but can readily adapt to dry areas as well (Lockhart et al. 1999)."
411	2010. Abdulla, P.. Flora of Pakistan Cupaniopsis anacardioides (A. Rich.) Radlk. in Sitzungsber. bayer. Akad. 9: 1530. 1879. et Pflanzenr. Sapind. 1186. 1933.. www.efloras.org, http://www.efloras.org/florataxon.aspx?flora_id=5&taxon_id=250063394	Tree

412	2007. Materson, J.. Cupaniopsis anacardioides (carrotwood). Smithsonian Marine Stations, Fort Pierce http://www.sms.si.edu/irlspec/cupaniopsis_anacardioides.htm	"Once it invades a new area, Cupaniopsis anacardioides can crowd out and outcompete native vegetation to form dense monospecific stands (Randall and Marinelli 1996)."
501	2010. Abdulla, P.. Flora of Pakistan Cupaniopsis anacardioides (A. Rich.) Radlk. in Sitzungsber. bayer. Akad. 9: 1530. 1879. et Pflanzenr. Sapind. 1186. 1933.. www.efloras.org, http://www.efloras.org/florataxon.aspx?flora_id=5&taxon_id=250063394	Terrestrial
502	2010. Abdulla, P.. Flora of Pakistan Cupaniopsis anacardioides (A. Rich.) Radlk. in Sitzungsber. bayer. Akad. 9: 1530. 1879. et Pflanzenr. Sapind. 1186. 1933.. www.efloras.org, http://www.efloras.org/florataxon.aspx?flora_id=5&taxon_id=250063394	Sapindaceae.
503	2010. WRA Specialist. Personal Communication.	Unknown.
504	2010. Abdulla, P.. Flora of Pakistan Cupaniopsis anacardioides (A. Rich.) Radlk. in Sitzungsber. bayer. Akad. 9: 1530. 1879. et Pflanzenr. Sapind. 1186. 1933.. www.efloras.org, http://www.efloras.org/florataxon.aspx?flora_id=5&taxon_id=250063394	Tree.
601	2010. WRA Specialist. Personal Communication.	No evidence of substantial reproductive failure.
602	2007. Materson, J.. Cupaniopsis anacardioides (carrotwood). Smithsonian Marine Stations, Fort Pierce http://www.sms.si.edu/irlspec/cupaniopsis_anacardioides.htm	"Sexual reproduction and propagation by means of seeds is the chief means of reproduction in Cupaniopsis anacardioides, a species that is recognized as a prolific seed producer."
603	2010. WRA Specialist. Personal Communication.	Unknown.
604	2007. Materson, J.. Cupaniopsis anacardioides (carrotwood). Smithsonian Marine Stations, Fort Pierce http://www.sms.si.edu/irlspec/cupaniopsis_anacardioides.htm	"Carrotwood is monoecious, with both male and female flowers occurring on the same plant."
604	2010. WRA Specialist. Personal Communication.	Unknown.
605	2005. Lockhart, C.. PCA fact sheet: carrotwood Cupaniopsis anacardioides. Plant Conservation Alliance®s Alien Plant Working Group, http://www.nps.gov/plants/alien/fact/cuan1.htm	"In its native range, carrotwood is pollinated by bees."
606	2007. Materson, J.. Cupaniopsis anacardioides (carrotwood). Smithsonian Marine Stations, Fort Pierce http://www.sms.si.edu/irlspec/cupaniopsis_anacardioides.htm	"Sexual reproduction and propagation by means of seeds is the chief means of reproduction in Cupaniopsis anacardioides, a species that is recognized as a prolific seed producer."
607	2007. Materson, J.. Cupaniopsis anacardioides (carrotwood). Smithsonian Marine Stations, Fort Pierce http://www.sms.si.edu/irlspec/cupaniopsis_anacardioides.htm	"This fast growing tree can reach a height of 10 m."
607	2010. WRA Specialist. Personal Communication.	Unknown.
701	2005. Lockhart, C.. PCA fact sheet: carrotwood Cupaniopsis anacardioides. Plant Conservation Alliance®s Alien Plant Working Group, http://www.nps.gov/plants/alien/fact/cuan1.htm	"The brightly colored fruit is a yellow, three-lobed capsule which, when ripe (May to June) splits open to expose three shiny black seeds encased in red or orange fleshy tissue."
701	2010. WRA Specialist. Personal Communication.	No evidence of plants growing in heavily trafficked area.

702	2005. Lockhart, C.. PCA fact sheet: carrotwood Cupaniopsis anacardioides. Plant Conservation Alliance®s Alien Plant Working Group, http://www.nps.gov/plants/alien/fact/cuan1.htm	"University of Florida Herbarium specimens document carrotwood cultivation as early as 1955 in eastern Florida. A separate introduction in Sarasota, Florida in 1968 resulted in large scale propagation and use as an ornamental tree. Carrotwood became a popular landscape tree throughout southern Florida in the late 1970s and early 1980s. By 1990, wild carrotwood seedlings began to be seen in the wild in various habitats."
703	2005. Lockhart, C.. PCA fact sheet: carrotwood Cupaniopsis anacardioides. Plant Conservation Alliance®s Alien Plant Working Group, http://www.nps.gov/plants/alien/fact/cuan1.htm	"While carrotwood invades a variety of natural communities, including dunes, coastal strand, sand pine scrub, slash pine flatwoods, cypress swamps, freshwater marshes and river banks, it poses a special threat to coastal ecosystems like mangrove swamps and tropical hammocks." [not grown or invading produce areas]
704	2005. Lockhart, C.. PCA fact sheet: carrotwood Cupaniopsis anacardioides. Plant Conservation Alliance®s Alien Plant Working Group, http://www.nps.gov/plants/alien/fact/cuan1.htm	"The brightly colored fruit is a yellow, three-lobed capsule which, when ripe (May to June) splits open to expose three shiny black seeds encased in red or orange fleshy tissue." [no adaptation for wind dispersal]
705	2007. Materson, J.. Cupaniopsis anacardioides (carrotwood). Smithsonian Marine Stations, Fort Pierce http://www.sms.si.edu/irlspec/cupaniopsis_anacardioides.htm	"Within it's native range Cupaniopsis anacardioides is found along rocky beaches and in sand dunes, and in hilly scrub and forested wetlands." "Seed dispersal by birds and small mammals is important, and transport via water may be important as well."
706	2007. Materson, J.. Cupaniopsis anacardioides (carrotwood). Smithsonian Marine Stations, Fort Pierce http://www.sms.si.edu/irlspec/cupaniopsis_anacardioides.htm	"Seed dispersal by birds and small mammals is important, and transport via water may be important as well."
707	2005. Lockhart, C.. PCA fact sheet: carrotwood Cupaniopsis anacardioides. Plant Conservation Alliance®s Alien Plant Working Group, http://www.nps.gov/plants/alien/fact/cuan1.htm	"The brightly colored fruit is a yellow, three-lobed capsule which, when ripe (May to June) splits open to expose three shiny black seeds encased in red or orange fleshy tissue." [no means of external attachment]
708	2007. Materson, J.. Cupaniopsis anacardioides (carrotwood). Smithsonian Marine Stations, Fort Pierce http://www.sms.si.edu/irlspec/cupaniopsis_anacardioides.htm	"Seed dispersal by birds and small mammals is important, and transport via water may be important as well."
801	2005. Lockhart, C.. PCA fact sheet: carrotwood Cupaniopsis anacardioides. Plant Conservation Alliance®s Alien Plant Working Group, http://www.nps.gov/plants/alien/fact/cuan1.htm	"Carrotwood is a prolific seed producer, and the brightly colored fruits are very attractive to birds which disperse it widely."
801	2007. Materson, J.. Cupaniopsis anacardioides (carrotwood). Smithsonian Marine Stations, Fort Pierce http://www.sms.si.edu/irlspec/cupaniopsis_anacardioides.htm	"Sexual reproduction and propagation by means of seeds is the chief means of reproduction in Cupaniopsis anacardioides, a species that is recognized as a prolific seed producer.
802	2008. Cook, A./Turner, S.R./Baskin, J.M./Baskin, C.C./Steadman, K.J./Dixon, K.W.. Occurrence of physical dormancy in seeds of Australian Sapinadaceae: a survey of 14 species in nine genera. Annals of Botany. 101: 1349-1362.	Non-dormant seeds.
803	2010. Langeland, K.A.. Natural area weeds: carrotwood (Cupaniopsis). SS-AGR-165: .University of Florida IFA Extension, http://edis.ifas.ufl.edu/pdffiles/AG/AG11100.pdf	"Stumps that are not treated with a herbicide will sprout to form multiple-trunked trees. If it is not objectionable for dead trees to be left standing, certain herbicides can be applied directly to the bark at the base of the tree (basal bark application). Herbicides that contain the active ingredient triclopyr amine (e.g. Brush-B-Gon, Garlon 3A Ultra) or glyphosate (e.g. Roundup) can be applied to cut stumps to prevent resprouting. The herbicide should be applied as soon as possible after felling the tree and concentrated on the thin layer of living tissue (cambium) that is just inside the bark. Herbicides with the active ingredient triclopyr ester can be used for basal bark applications."
804	2010. Langeland, K.A.. Natural area weeds: carrotwood (Cupaniopsis). SS-AGR-165: .University of Florida IFA Extension, http://edis.ifas.ufl.edu/pdffiles/AG/AG11100.pdf	"The final cut should be made as close to the ground as possible and as level as possible to facilitate application of a herbicide to prevent sprouting. Stumps that are not treated with a herbicide will sprout to form multiple-trunked trees."
805	2010. WRA Specialist. Personal Communication.	Unknown [specific enemy or enemies unknown]