

<i>Eucalyptus deglupta</i> (Deglupta, Kamarere, Mindanao Gum) -- FLORIDA		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 FL climates (USDA hardiness zones; 0-low, 1-intermediate, 2-high)	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 regions with an average of 11-60 inches of annual precipitation	n	0
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	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	?	
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals	?	
4.05	Toxic to animals	?	
4.06	Host for recognised pests and pathogens	y	1
4.07	Causes allergies or is otherwise toxic to humans		
4.08	Creates a fire hazard in natural ecosystems	?	
4.09	Is a shade tolerant plant at some stage of its life cycle	?	
4.10	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils). North & Central Zones: infertile soils; South Zone: shallow limerock or Histisols.	y	1
4.11	Climbing or smothering growth habit	n	0
4.12	Forms dense thickets		
5.01	Aquatic	n	0
5.02	Grass	n	0
5.03	Nitrogen fixing woody plant	n	0
5.04	Geophyte	n	0
6.01	Evidence of substantial reproductive failure in native habitat		
6.02	Produces viable seed	y	1
6.03	Hybridizes naturally		
6.04	Self-compatible or apomictic		
6.05	Requires specialist pollinators		
6.06	Reproduction by vegetative propagation	?	
6.07	Minimum generative time (years)	1.5	1

7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
7.02	Propagules dispersed intentionally by people	y	1
7.03	Propagules likely to disperse as a produce contaminant		
7.04	Propagules adapted to wind dispersal	y	1
7.05	Propagules water dispersed	y	1
7.06	Propagules bird dispersed	n	-1
7.07	Propagules dispersed by other animals (externally)	n	-1
7.08	Propagules dispersed by other animals (internally)	n	-1
8.01	Prolific seed production	y	1
8.02	Evidence that a persistent propagule bank is formed (>1 yr)	n	-1
8.03	Well controlled by herbicides	?	
8.04	Tolerates, or benefits from, mutilation or cultivation	n	-1
8.05	Effective natural enemies present in U.S.		
	Total Score		8
	Implemented Pacific Second Screening		No
	Risk Assessment Results		Reject

	Reference	Source data
1.01		Cultivated but no evidence of selection for reduced weediness.
1.02		Skip to 2.01
1.03		Skip to 2.01
2.01	1. PERAL NAPPFAST Global Plant Hardiness (http://www.nappfast.org/Plant_hardiness/NAPPFAST%20Global%20zones/10-year%20climate/PLANT_HARDINESS_10YR%20lgnd.tif) & USDA Plant Hardiness Zone Map, 2012. Agricultural Research Service, U.S. Department of Agriculture. Accessed from http://planthardiness.ars.usda.gov . 2. USDA/ARS-GRIN [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?15948 [Accessed: 8 May 2012]). 3.a-b. Francis, John K. 1988. <i>Eucalyptus deglupta</i> Blume. Kamarere. SO-ITF-SM-16. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 5 p. & Australia's Virtual Herbarium. 2009. http://chah.gov.au/avh/index.jsp . Accessed: 8 May 2012.	No computer analysis was performed. 1. Global plant hardiness zones 10-13; equivalent to USDA Hardiness zones 10a+ (south zone of Florida). 2. Native distribution: Indonesia, Papua New Guinea, Philippines. 3.a. Natural distribution found between 9°N and 11°S, covers the area of Mindanao, Philippines, Sulawesi & Irian Jaya Ceram, Indonesia, and Papua New Guinea, including New Britain. 3.b. Does not happen naturally in Australia; herbarium specimens have been collected from eastern Queensland.
2.02		No computer analysis was performed. 1. Native range is well known; refer to 2.01 source data.
2.03	1. Köppen-Geiger climate map (http://www.hydrol-earth-syst-sci.net/11/1633/2007/hess-11-1633-2007.pdf).	1. Native distribution appears to be in two, possibly three, climatic groups (Af, Am, and possibly Aw).
2.04	1. Francis, John K. 1988. <i>Eucalyptus deglupta</i> Blume. Kamarere. SO-ITF-SM-16. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 5 p.	1. Annual rainfall varies between 2000 mm-5000 mm (78.7"-196.9"); most commercial stands average between 2500 mm-3500 mm (98.4"-137.8").
2.05	1. Francis, John K. 1988. <i>Eucalyptus deglupta</i> Blume. Kamarere. SO-ITF-SM-16. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 5 p. 2. USDA, NRCS. 2012. The PLANTS Database (http://plants.usda.gov , 2 July 2012). National Plant Data Team, Greensboro, NC 27401-4901 USA. http://plants.usda.gov . Accessed: 14 May 2012. 3. Pacific Island Ecosystems at Risk (PIER). Global Compendium of Weeds. http://www.hear.org . Accessed 22 May 2012.	1. Has been planted throughout the humid tropics: Solomon Islands, Fiji, Samoa, Taiwan, Malaysia, Coast D'Ivoire, Costa Rica, Honduras, Brazil, Cuba, and Puerto Rico. 2. Present in Hawaii and Puerto Rico. 3. Ecuador, United States (HI, PR) Tropics (ambiguous).

3.01	1. Wagner, W.L. et al. <i>Manual of the Flowering Plants of Hawai'i</i> . Vol. 1. Honolulu, HI: Bishop Museum Press, 1990. Print. 2. Pacific Island Ecosystems at Risk (PIER). Global Compendium of Weeds. http://www.hear.org . Accessed 14 May 2012.	1. "in Hawai'i extensively planted on Kaua'i, O'ahu, Moloka'i, and Hawai'i, and reproducing by seed in these areas." 2. Naturalized in Pohnpei (Micronesia), Ecuador, Hawaii, Puerto Rico.
3.02		No evidence.
3.03		No evidence.
3.04		No evidence.
3.05	1. Holm, L. et al. <i>A Geographical Atlas of World Weeds</i> . John Wiley and Sons, New York. 1979.	1. The following <i>eucalypts</i> are considered principal weeds in Australia (principal weed in this context is ranked according to the importance of the weed and is usually referring to about the five most troublesome species for the crop): <i>E. cambageana</i> , <i>E. ferruginea</i> , <i>E. gracilis</i> , <i>E. marginata</i> , <i>E. miniata</i> , <i>E. pilularis</i> , <i>E. populnea</i> , <i>E. tetradonta</i> .
4.01		No evidence.
4.02	1. Anonymous. 2009. "Focus on Eucalypts." SAPIA NEWS No. 12. ARC-Plant Protection Research Institute, South Africa. 2. Anonymous. October 2010. Scotland, Forestry Commission. Interim Guidance on the Grant Aiding and Planting of Eucalypts in Scotland. Accessed: 1 June 2012. 3. Rejmánek, M. & D.M. Richardson. 2011. Eucalypts (203-209). In D. Simberloff & M. Rejmánek, eds. <i>Encyclopedia of Biological Invasions</i> . Berkeley: University of California Press.	1. It is likely that most Eucalypts are allelopathic-having the potential to suppress understory plants through chemical inhibitors that leach into the soil. 2. There are many reports in global literature of toxic inhibition of germination and growth of other plant species (allelopathic effects), which inhibits the growth of an understory. 3. Concerns expressed about suppression of ground vegetation due to possible allelopathic effects. Allelopathic effects are widely reported and these reports are largely based on laboratory bioassays. If not chemical inhibition then at least accumulation of dead material of the floor of eucalypt plantations hinders regeneration of native species.
4.03		No evidence.
4.04	1. United States Department of Agriculture Permit applications 08-11-106rm and 08-014-101rm received from ArborGen LLC. Field testing of genetically engineered <i>E. grandis</i> X <i>E. urophylla</i> (http://www.aphis.usda.gov/brs/aphisdocs/08_014101rm_ea2.pdf [Accessed: 8/19/2010]).	1. Eucalyptus species are known to produce chemical compounds that are required by the plant for defense against herbivores and pathogens.
4.05	1. <i>Medicinal Plants for Livestock: Eucalyptus spp.</i> Cornell University, Department of Animal Science. http://www.ansci.cornell.edu/plants/medicinal/eucalyp.html . 1 June 2012.	1. "Eucalyptus spp. contain high levels of phenolics and terpenoids which can be toxic. Animals such as the koala which eat Eucalyptus have developed methods for detoxifying the compounds in the liver. In addition, they have bacteria that degrade tannin-protein complexes. Most animals do not have this ability."

4.06	1. Waterhouse, D.F. 1997. <i>The Major Invertebrate Pests and Weeds of Agriculture and Plantation Forestry in the Southern and Western Pacific</i> . Australian Centre for International Agricultural Research. ACIAR Monograph No. 44, 99p. Print.	1. <i>E. deglupta</i> is the principle tree attacked for <i>Agrilus opulentus</i> Kerremans (Coleoptera: Buprestidae), <i>Amblypelta cocophaga</i> China (Hemiptera: Coeidae), <i>Microcerotermes biroi</i> (Isoptera: Termitidae), <i>Nasutitermes novarum-hebridarum</i> (Isoptera: Termitidae), <i>Oribius destructor</i> Marshall (Coleoptera: Curculionidae), <i>Oribius inimicus</i> Marshall (Coleoptera: Cuculionidae), <i>Oxymagis horni</i> Heller (Coleoptera: Cerambycidae), <i>Paratella errudita</i> Melichar (Hemiptera: Flatidae), <i>Rhyparida coriacea</i> Jacoby (Coleoptera: Chrysomelidae), and <i>Zeuzera coffeae</i> Nietner (Lepidoptera: Cossidae) in the southern and western Pacific.
4.07		
4.08	1. Gill, A.M. "Eucalypts and fires: interdependent or independent?" In: <i>Eucalypt ecology: individuals to ecosystems</i> . Ed. J.E. Williams & J. Woinarski. Cambridge, New York: Cambridge University Press, 1997. 2. Rejmánek, M. & D.M. Richardson. 2011. Eucalypts (203-209). In D. Simberloff & M. Rejmánek, eds. <i>Encyclopedia of Biological Invasions</i> . Berkeley: University of California Press.	1. Eucalypts often are the major source of fuel for fires, but not always. 2. Accumulated litter in dense stands of eucalypt stands are extremely flammable.
4.09	1. " <i>Eucalyptus deglupta</i> ". <i>horticopia.com</i> . Horticopia, 2011. Web. 1 June 2012. 2. Rejmánek, M. & D.M. Richardson. 2011. Eucalypts (203-209). In D. Simberloff & M. Rejmánek, eds. <i>Encyclopedia of Biological Invasions</i> . Berkeley: University of California Press.	1. Exposure: Partial shade or partial sun to full sun. 2. Shade-tolerant sub-canopy [<i>Eucalyptus</i>] species are not known.
4.10	1. " <i>Eucalyptus deglupta</i> ". <i>horticopia.com</i> . Horticopia, 2011. Web. 1 June 2012.	1. "This plant tolerates some drought and some salt. This plant will grow in dry soil. Suitable soil is well-drained/loamy, sandy or clay. The pH preference is an acidic to slightly alkaline (less than 6.8 to 7.7) soil.
4.11	1. Wagner, W.L. et al. <i>Manual of the Flowering Plants of Hawai'i</i> . Vol. 1. Honolulu, HI: Bishop Museum Press, 1990. Print.	1. "Trees 35-60 m tall".
4.12		
5.01	1. Whistler, W.A. 2000. <i>Tropical Ornamentals: A Guide</i> . Portland, Oregon: Timber Press. Print.	1. "Deep, sandy soils in sunny places are preferred."
5.02	1. USDA/ARS-GRIN [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?15948 [Accessed: 8 May 2012]).	1. Family: <i>Myrtaceae</i> .

5.03	1. USDA/ARS-GRIN [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?15948 [Accessed: 8 May 2012]).	1. Family: <i>Myrtaceae</i> .
5.04	1. Wagner, W.L. et al. <i>Manual of the Flowering Plants of Hawai'i</i> . Vol. 1. Honolulu, HI: Bishop Museum Press, 1990. Print.	1. "Trees 35-60 m tall".
6.01		
6.02	1.a-b. Francis, John K. 1988. <i>Eucalyptus deglupta</i> Blume. Kamarere. SO-ITF-SM-16. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 5 p. 2. Brink, M., 2011. <i>Eucalyptus deglupta</i> Blume. [Internet] Record from Protabase. Brink, M. & Achigan-Dako, E.G. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. < http://database.prota.org/search.htm >. Accessed 22 May 2012.	1.a. 1g of seed = 15K-18K seeds, and about 2K-3K/g are viable. 1.b. Germination of high quality seed can be as high as 90%. 2. Easily propagated by seed and have 50-60% germination rate; 1g of seed produces 1K-2K seedlings.
6.03		
6.04		
6.05		
6.06	1. Brink, M., 2011. <i>Eucalyptus deglupta</i> Blume. [Internet] Record from Protabase. Brink, M. & Achigan-Dako, E.G. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. < http://database.prota.org/search.htm >. Accessed 22 May 2012.	1. Natural vegetation propagation is unknown. Vegetative propagation with branch cuttings is easier than with other <i>Eucalyptus</i> species, and even cuttings from crowns of old trees can be used. The cuttings will root when their base is immersed in water alone. Plants 25–30 cm tall normally develop from cuttings within 6 weeks in tropical environments.
6.07	1. Brink, M., 2011. <i>Eucalyptus deglupta</i> Blume. [Internet] Record from Protabase. Brink, M. & Achigan-Dako, E.G. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. < http://database.prota.org/search.htm >. Accessed 22 May 2012. 2. Francis, John K. 1988. <i>Eucalyptus deglupta</i> Blume. Kamarere. SO-ITF-SM-16. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 5 p.	1. Flowering may occur in the first year but more likely it takes place after 2 years. Fruiting can start as early as 1.5 years after planting, but more commonly after 3-4 years. 2. Begins to bloom usually in 3-4 years on the plantations.
7.01		

7.02	<p>1. USDA/ARS-GRIN [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?15948 [Accessed: 8 May 2012]). 2.a-e. Brink, M., 2011. <i>Eucalyptus deglupta</i> Blume. [Internet] Record from Protabase. Brink, M. & Achigan-Dako, E.G. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. < http://database.prota.org/search.htm>. Accessed 22 May 2012.</p>	<p>Species is being considered for introduction as a biomass crop. 1. Economic importance: fuels (fuelwood), materials (fiber & wood). 2.a. Major plantation tree for pulp production; wood is valuable lumber; also used as fuelwood and for charcoal but is usually considered to valuable for these purposes. 2.b. Widely planted as an ornamental because of its attractive bark. 2.c. Tree used for land reclamation, reforestation, and forest enrichment. 2.d. Commonly used as shade tree in coffee plantations in Costa Rica. 2.e. Bee forage.</p>
7.03		
7.04	<p>1. Brink, M., 2011. <i>Eucalyptus deglupta</i> Blume. [Internet] Record from Protabase. Brink, M. & Achigan-Dako, E.G. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. < http://database.prota.org/search.htm>. Accessed 22 May 2012. 2. Francis, John K. 1988. <i>Eucalyptus deglupta</i> Blume. Kamarere. SO-ITF-SM-16. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 5 p.</p>	<p>1. Seeds minute, brown, flattened, with a small terminal wing. 2. Kamarere seeds are winged and, together with the small size of the seed, can be taken to nearby areas.</p>
7.05	<p>1. Brink, M., 2011. <i>Eucalyptus deglupta</i> Blume. [Internet] Record from Protabase. Brink, M. & Achigan-Dako, E.G. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. < http://database.prota.org/search.htm>. Accessed 22 May 2012. 2. Francis, John K. 1988. <i>Eucalyptus deglupta</i> Blume. Kamarere. SO-ITF-SM-16. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 5 p. 3. Rejmánek, M. & D.M. Richardson. 2011. Eucalypts (203-209). In D. Simberloff & M. Rejmánek, eds. Encyclopedia of Biological Invasions. Berkeley: University of California Press.</p>	<p>1.a. Seeds minute, brown, flattened, with a small terminal wing. 1.b. Dispersal is mainly through water. 2. Water is the most important vehicle for dispersing seeds, as the sites where it grows are located in floodplains along rivers. 3. Eucalypts should not be planted near rivers/streams. Temporarily flooded or eroded river/stream banks are suitable habitat for spontaneous establishment of seedlings. Additionally, their seeds can be dispersed for long distances by running water.</p>
7.06	<p>1. Southern, S.G. et al. 2004. Review of gene movement by bats and birds and its potential significance for eucalypt plantation forestry. <i>Australian Forestry</i>, 67(1): 44-53.</p>	<p>1. Dispersal in animal droppings does not occur, although many birds eat eucalypt seed, because the seed does not survive passage through the alimentary canal of mammals and birds (Joseph 1986).</p>

7.07	1. Brink, M., 2011. <i>Eucalyptus deglupta</i> Blume. [Internet] Record from Protabase. Brink, M. & Achigan-Dako, E.G. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. < http://database.prota.org/search.htm >. Accessed 22 May 2012.	1. No adaptations that would suggest that it could attach itself externally to animals. Seeds minute, brown, flattened, with a small terminal wing.
7.08	1. Southern, S.G. et al. 2004. Review of gene movement by bats and birds and its potential significance for eucalypt plantation forestry. <i>Australian Forestry</i> , 67(1): 44-53.	1. Dispersal in animal droppings does not occur, although many birds eat eucalypt seed, because the seed does not survive passage through the alimentary canal of mammals and birds (Joseph 1986).
8.01	1.a-b. Francis, John K. 1988. <i>Eucalyptus deglupta</i> Blume. Kamarere. SO-ITF-SM-16. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 5 p. 2. Brink, M., 2011. <i>Eucalyptus deglupta</i> Blume. [Internet] Record from Protabase. Brink, M. & Achigan-Dako, E.G. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. < http://database.prota.org/search.htm >. Accessed 22 May 2012.	1.a. Each capsule contains 12-48 seeds. 1.b. Nine seed trees at 10 yo produced 87g seed/tree. 87 g seed x 15K = 1,305,000 seeds; 87 g seed x 18K = 1,566,000 seeds. 2. Seed production is often profuse.
8.02	1. Rejmánek, M. & D.M. Richardson. 2011. Eucalypts (203-209). In D. Simberloff & M. Rejmánek, eds. <i>Encyclopedia of Biological Invasions</i> . Berkeley: University of California Press.	1. Eucalypt seeds do not have dormancy and seed storage in the soil lasts less than a year.
8.03	1. Rejmánek, M. & D.M. Richardson. 2011. Eucalypts (203-209). In : D. Simberloff & M. Rejmánek, eds. <i>Encyclopedia of Biological Invasions</i> . Berkeley: University of California Press.	1. Triclopyr or glyphosate applied to freshly cut stumps can greatly reduce resprouting.
8.04	1. Brink, M., 2011. <i>Eucalyptus deglupta</i> Blume. [Internet] Record from Protabase. Brink, M. & Achigan-Dako, E.G. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. < http://database.prota.org/search.htm >. Accessed 22 May 2012.	1. <i>E. deglupta</i> does not regenerate from lignotubers; therefore, mature trees are sensitive to intense fire, and coppice harvests are usually not possible after the first harvest.
8.05		