Eucalyptus microcorys (Tallowwood) -- 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	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		
3.03	Weed of agriculture		
3.04	Environmental weed	?	
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		
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	n	0
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	n	0
6.06	Reproduction by vegetative propagation		
6.07	Minimum generative time (years)		

Completed: July 2012

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	n	-1
7.05	Propagules water dispersed	?	
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		
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	y	1
8.05	Effective natural enemies present in U.S.		
	Total Score	**5**	
	Implemented Pacific Second Screening	**Yes**	
	Risk Assessment Results	**Accept**	

	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. Boland, D.J. et al. *Forest Trees of Australia* . 5th ed. Collingswood, Victoria, Australia: CSIRO, 2006. Print.	**No computer analysis was performed**. 1. Global plant hardiness zones 9-10; equivalent to USDA Hardiness zones 8b-10a (north, central, and south zones of Florida). 2. Native distribution: northeast New South Wales and Queensland, Australia. 3. Widely distributed in northern coastal New South Wales and southeastern 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). 2. Boland, D.J. et al. *Forest Trees of Australia* . 5th ed. Collingswood, Victoria, Australia: CSIRO, 2006. Print.	1. Native distribution appears to be in three climatic groups (BSk, Cfa, Cfb). 2. Altitudinal range from near sea level to 750 m (2460.6').
2.04	1. Australia's Virtual Herbarium. 2009. http://chah.gov.au/avh/index.jsp. Accessed: 9 May 2012. 2. Boland, D.J. et al. *Forest Trees of Australia* . 5th ed. Collingswood, Victoria, Australia: CSIRO, 2006. Print.	1. 300 mm-3200 mm (11.8"- 126.0"). 2. 1000 mm-1850 mm (39.4"-70.9").
2.05	1. USDA, NRCS. 2012. The PLANTS Database (http://plants.usda.gov, 2 July 2012). National Plant Data Team, Greensboro, NC 27401-4901 USA. Accessed: 25 May 2012. 2. Hawaiian Ecosystems at Risk project (HEAR), The Global Compendium of Weeds. http://www.hear.org/gcw/. Accessed 25 May 2012. 3. 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. Present in Hawaii. 2. Present in Ecuador, Victoria, Western Australia, Hawaii. 3. Cultivated in Australia.

3.01	1. Wagner, W.L. et al. *Manual of the Flowering Plants of Hawai'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 planted on Kaua'I, O'ahu, Moloka'I, Maui, and Hawai'I, and regenerating both within and adjacent to the plantations." 2. Naturalized in Ecuador, Western Australia.
3.02		
3.03		
3.04	1. Pacific Island Ecosystems at Risk (PIER). Global Compendium of Weeds. http://www.hear.org. Accessed 14 May 2012.	Requested article to verify claim. 1. Listed on "Environmental Weed Invasions in Victoria" on The naturalized vascular plants of Western Australia - 1: Checklist, environmental weeds and distribution in IBRA regions (Plant Protection Quarterly, 19(1): 13-32).
3.05	1. Holm, L. et al. *A Geographical Atlas of World Weeds* . John Wiley and Sons, New York. 1979.	1. The following *eucalypts* 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): *E. cambageana, E. ferruginea, E. gracilis, E. marginata, E. miniata, E. pilularis, E. populnea, E. tetradonta* .
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. Encyclopedia of Biological Invasions. 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 E. grandis X E. urophylla (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. *Medicinal Plants for Livestock: Eucalyptus spp* . 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		
4.07		
4.08	1. Gill, A.M. "Eucalypts and fires: interdependent or independent?" In: *Eucalypt ecology: individuals to ecosystems* . 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. *Encyclopedia of Biological Invasions.* Berkeley: University of California Press.	1. Eucalypts often are the major source of fuel for fires, but not always. 2. Leaves of eucalypts are relatively slow to breakdown and have a high volatile oil content, which contributes to the severity of fire events in their native Australia.
4.09	1. Rejmánek, M. & D.M. Richardson. 2011. Eucalypts (203-209). In D. Simberloff & M. Rejmánek, eds. Encyclopedia of Biological Invasions. Berkeley: University of California Press.	1. Shade-tolerant sub-canopy [Eucalyptus] species are not known.
4.10	1. *Eucalyptus microcorys* F. Muell. FloraBase: Flora of Western Australia. Accessed 1 June 2012. http://florabase.dec.wa.gov.au/browse/profile/18602. 2. The Royal Botanic Gardens and Domain Trust (30 January 2012). PlantNET - The Plant Information Network System of The Royal Botanic Gardens and Domain Trust, Sydney, Australia (version 2.0). http://plantnet.rbgsyd.nsw.gov.au. 3. Boland, D.J. et al. *Forest Trees of Australia* . 5th ed. Collingswood, Victoria, Australia: CSIRO, 2006. Print.	1. "Brown loam over laterite, clay." 2. "On moderately to highly fertile soils often on slopes". 3. Prefers fertile soils but will grow on rather poor sands if subsoil moisture is adequate.
4.11	1. Wagner, W.L. et al. *Manual of the Flowering Plants of Hawai'i.* Vol. 1. Honolulu, HI: Bishop Museum Press, 1990. Print.	1. "Trees 30-60 m tall"
4.12	1. Boland, D.J. et al. *Forest Trees of Australia* . 5th ed. Collingswood, Victoria, Australia: CSIRO, 2006. Print.	1. Tall to very tall tree, with straight clear boles to two-thirds of the total height.
5.01	1. Eucalyptus microcorys F. Muell. FloraBase: Flora of Western Australia. Accessed 1 June 2012. http://florabase.dec.wa.gov.au/browse/profile/18602. 2. Boland, D.J. et al. *Forest Trees of Australia* . 5th ed. Collingswood, Victoria, Australia: CSIRO, 2006. Print.	1. Disturbed woodland, creekline. 2. Occurs mainly in tall open forests commonly on rainforests fringes.
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: *Myrtaceae.*

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: *Myrtaceae.*
5.04	1. Wagner, W.L. et al. *Manual of the Flowering Plants of Hawai'i* . Vol. 1. Honolulu, HI: Bishop Museum Press, 1990. Print.	1. "Trees 30-60 m tall"
6.01		
6.02	1. Pacific Island Ecosystems at Risk (PIER). http://www.hear.org. Via: Penfold, A.R. and J.L. Willis. *The Eucalypts: Botany, Cultivation and Utilization* . Leonard Hill Limited, London, and Interscience Publishers, Inc., New York. 1961. Print	1. Although seeding is not always regular, regenerates well in its natural habitat.
6.03		
6.04		
6.05	1. NSW Government. Industry and Investment. http://www.dpi.nsw.gov.au/agriculture/resources/private-forestry/paddock-plants/Eucalyptus-microcorys-Tallowwood.pdf. Accessed 25 May 2012. Web.	1. Excellent wildlife habitat; flowers are used by honeyeaters, lorikeets and flying foxes.
6.06		
6.07		
7.01		
7.02	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]).	Species is being considered for introduction as a biomass crop. 1. Economic importance: ornamental and materials (wood).
7.03		
7.04	1. Boland, D.J. et al. *Forest Trees of Australia* . 5th ed. Collingswood, Victoria, Australia: CSIRO, 2006. Print. 2. Potts, B. 1990. The response of eucalypt populations to a changing environment. Tasforests, December: 179-193. 3. Cremer, K.W. 1977. Distance of seed dispersal in Eucalypts estimated from seed weights. Australian Forest Research, 7(4): 225-228. 4. Rejmánek, M. & D.M. Richardson. 2011. Eucalypts (203-209). In: D. Simberloff & M. Rejmánek, eds. Encyclopedia of Biological Invasions. Berkeley: University of California Press.	No adaptions for wind dispersal (i.e., lacks wings). 1. Seed ellipsodial, yellow-brown, partly 'honeycombed' seedcoat, hilum ventral. 2. Seed dispersal in most eucalypt species is mainly by wind and gravity. 3. Wind is probably the only important agent of seed dispersal in the eucalypts, except possibly in species growing on river margins or flood plains where water could also transport the seed. 4. Relatively limited seed dispersal; planted eucalypts are very small and have no adaptions for dispersal (wings or fleshy). The passive release of seeds is undoubtedly aided by wind; however all rigorous studies of eucalypt seed dispersal and seedling spatial distribution show that in general seeds are dispersed over quite short distances that are in agreement with measurement of terminal descent velocity.

7.05	1. Rejmánek, M. & D.M. Richardson. 2011. Eucalypts (203-209). In D. Simberloff & M. Rejmánek, eds. *Encyclopedia of Biological Invasions* . Berkeley: University of California Press.	1. 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.
7.06	1. Southern, S.G. et al. 2004. Review of gene movement by bats and birds and its potential significance for eucalypt plantation forestry. *Australian Forestry* , 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).
7.07	1. Boland, D.J. et al. *Forest Trees of Australia* . 5th ed. Collingswood, Victoria, Australia: CSIRO, 2006. Print.	No adaptations that would suggest that it could attach itself externally to animals. 1. Seed ellipsodial, yellow-brown, partly 'honeycombed' seedcoat, hilum ventral.
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. *Australian Forestry* , 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		
8.02	1. Rejmánek, M. & D.M. Richardson. 2011. Eucalypts (203-209). In D. Simberloff & M. Rejmánek, eds. *Encyclopedia of Biological Invasions* . 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. *Encyclopedia of Biological Invasions* . Berkeley: University of California Press.	1. Triclopyr or glyphosate applied to freshly cut stumps can greatly reduce resprouting.
8.04	1. Pacific Island Ecosystems at Risk (PIER). http://www.hear.org. Via: (a)Guinto, D. F., House, A. P. N., Xu ZhiHong, Saffigna, P. G. 1999. Impacts of repeated fuel reduction burning on tree growth, mortality and recruitment in mixed species eucalypt forests of southeast Queensland, Australia. *Forest Ecology and Management* , 115(1): 13-27. (b)Rajan, B. K. C. 1983. The first Eucalyptus exotic plot in G.K.V.K. *Myforest* ,19: 80-83	1. (a)The diameter growth of *E. microcorys* … was not affected by either burning treatment. (b) Good coppice ability.
8.05		