Lantana montevidensis (Trailing shrubverbena, Creeping lantana, Trailing lantana, Weeping lantana)		**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 with mean annual precipitation of 40-70 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	y	4
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	?	
4.06	Host for recognised pests and pathogens	y	1
4.07	Causes allergies or is otherwise toxic to humans.	y	1
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).	y	1
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	n	0
5.04	Geophyte	n	0
6.01	Evidence of substantial reproductive failure in native habitat	n	0
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	y	1
6.07	Minimum generative time (years)	1	1
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y	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	n	-1
7.05	Propagules water dispersed	y	1
7.06	Propagules bird dispersed	y	1
7.07	Propagules dispersed by other animals (externally)	y	1
7.08	Propagules dispersed by other animals (internally)	y	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	y	-1
8.04	Tolerates, or benefits from, mutilation or cultivation	y	1
8.05	Effective natural enemies present in Florida, or east of the continental divide.	?	
	Total Score	**29**	
	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		
1.03		
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). 2. USDA/ARS-GRIN [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?15948. 3. Pacific Island Ecosystems at Risk (PIER). http://www.hear.org/. 4.a-b. Horticopia professional software. http://www.horticopia.com/. 5. Dehgan, B. *Landscape Plants for Subtropical Climates* . Gainesville: University Press of Florida, 1998. Print.	**No computer analysis was performed**. 1. Global plant hardiness zones: (7?-) 8-11 . 2. Native to: Argentina, Boliva, Brazil, Paraguay, Uruguay. 3. Native to southern Brazil, Uruguay, Paraguay, and Argentina. 4.a. Native habitat: South America. 4.b. Hardiness range: 8B-11 (USDA). 5. Native habitat: South America.
2.02		**No computer analysis was performed**. 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. Distribution in the native range and naturalized range (specifically New South Wales & Queensland, Australia) is widespread and occurs in more than 3 climatic groups.
2.04	1. Globalis (http://globalis.gvu.unu.edu/).	1. South America: 4"-79" (100mm-2000mm); NSW & QL, Australia: 4"-40" (100mm-1000mm).
2.05	1.a-b. Pacific Island Ecosystems at Risk (PIER). http://www.hear.org/. 2. Parsons, W.T. and E.G. Cuthbertson. *Noxious Weeds of Australia* . 2nd ed. Victoria, Australia: CSIRO, 2001. Print. 3. Wagner, W.L. et al. *Manual of the Flowering Plants of Hawaii* . Revised ed Vol. II. Hawaii: University of Hawaii Press, 1990. Print. 4. Johnson, S.B. et al. T*he problem with Lantana montevidensis (creeping lantana)* , In: *Managing weeds in a changing climate. 15th Australian Weeds Conference, Paper and Proceedings* . 24-28 September 2006, Adelaide, South Australia. Victoria, Australia: Weed Management Society of South Australia, 2006.	1.a. Cultivated nearly worldwide and naturalized in many tropical and subtropical areas (Wagner er al 1999). 1.b. Introduced and/or cultivated in: Ecuador: Santa Cruz Island; Fiji: Vanua Levu Island & Viti Vevu Island; French Polynesia Society Islands: Moorea Island, Raiatea (Havai) Island, Tahiti Island, Tetiaroa Atoll; Guam; Hawaii Islands: Kauai & Lanai; New Caledonia Archipelago: Ile Grande Terre; New Zealand; Soloman Islands. 2. Has been introduced to most other tropical and subtropical regions as a ground-covering ornamental. 3. Cultivated in Hawaii as early as 1930. 4. Has spread extensively in eastern Australia.

3.01	1. Pacific Island Ecosystems at Risk (PIER). http://www.hear.org/. 2. Dehgan, B. *Landscape Plants for Subtropical Climates* . Gainesville: University Press of Florida, 1998. Print. 3. Parsons, W.T. and E.G. Cuthbertson. *Noxious Weeds of Australia* . 2nd ed. Victoria, Australia: CSIRO, 2001. Print. 4. Wagner, W.L. et al. *Manual of the Flowering Plants of Hawaii* . Revised ed Vol. II. Hawaii: University of Hawaii Press, 1990. Print. 5. Johnson, S.B. et al. *The problem with Lantana montevidensis (creeping lantana)* , In: *Managing weeds in a changing climate. 15th Australian Weeds Conference, Paper and Proceedings* . 24-28 September 2006, Adelaide, South Australia. Victoria, Australia: Weed Management Society of South Australia, 2006.	1. Cultivated nearly worldwide and naturalized in many tropical and subtropical areas (Wagner er al 1999). 2. Naturalized in lower southeastern U.S. 3. It is considered a weed in Australia, where it occurs in coastal and subcoastal Queensland, northern New South Wales, and in some Northern Territory towns. 4. First naturalized collection made in 1986. 5. *L. montevidensis* has naturalized in Australia.
3.02	1. USDA/ARS-GRIN [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?15948.	1. Weed in Australia.
3.03	1. Holm, L. et al. *A Geographical Atlas of World Weeds* . New York: John Wiley & Sons, 1979. Print. 2. Parsons, W.T. and E.G. Cuthbertson. *Noxious Weeds of Australia* . 2nd ed. Victoria, Australia: CSIRO, 2001. Print. 3. Johnson, S.B. et al. *The problem with Lantana montevidensis (creeping lantana)* , In: *Managing weeds in a changing climate. 15th Australian Weeds Conference, Paper and Proceedings* . 24-28 September 2006, Adelaide, South Australia. Victoria, Australia: Weed Management Society of South Australia, 2006. 4.a-d. New South Wales Department of Primary Industries, prepared by S.B. Johnson. 2007. *Review of the declaration of Lantana species in New South Wales* .	1. Present as a weed in Australia (rank of importance unknown). 2. The presence of creeping lantana thickets reduces the available grazing area. 3. Forms dense low growing thickets invading pastures. 4.a. Day et al (1999) outlined evidence that *L. montevidensis* infested hundereds of thousands of hectares throughout central Qld. 4.b. One of the most severally affected areas is the North Burnett where sever infestations have decreased grazing animal carrying capacities so as to threaten the viability of these enterprises resulting in decreases in land values (O'Donnell 2002). 4.c. Neal (1999) also stated that infestations of this species have resulted in significant land devaluation and loss of income. 4.d. Over runs pasture ecosystems, shading out more desirable species and their production, often producing pure stands that are inaccessible to people and livestock.

3.04	1. Johnson, S.B. et al. *The problem with Lantana montevidensis (creeping lantana)* , In: *Managing weeds in a changing climate. 15th Australian Weeds Conference, Paper and Proceedings* . 24-28 September 2006, Adelaide, South Australia. Victoria, Australia: Weed Management Society of South Australia, 2006. 2.a-b. New South Wales Department of Primary Industries, prepared by S.B. Johnson. 2007. *Review of the declaration of Lantana species in New South Wales* .	1. Forms dense low growing thickets invading many natural ecosystems. 2.a. Considered a weed of natural ecosystems, and in particular national parks, because it is an efficient pioneer species that displaces native vegetataion (Flannery. 1997; O'Donnell 2002; Bray 2002; Cooperative Research Centre for Australian Weed Management 2003). 2.b. It is common weed of open woodland and dry sclerophyll forest in SE Qld and disturbed areas behind mangroves (Munir 1996; O'Donnell 2002). Some evidence sugget that it reduced plant and animal biodiversity in these and other ecosystems where it occurred (Munir 1996; O'Donnell 2002; S. Csurhes pers. comm).
3.05	1. Holm, L. et al. *A Geographical Atlas of World Weeds* . New York: John Wiley & Sons, 1979. Print.	1. *L. camara* is a serious weed in at least 10 countries; a principal weed in at least 12 countries; a common weed in at least 3 countries; present as a weed (rank of importance unknown) in at least 22 countries; present in the flora (unknown if plant behaves as a weed) in at least 3 countries.
4.01		
4.02		
4.03		
4.04	1. Wade, G.L. & M.T. Mengak. 2010. Deer-Tolerant Ornamental Plants. http://www.caes.uga.edu/Publications/displayHTML.cfm?pk_id=7872.	1. *L. montevidensis* was present on the list of "Vines and Groundcovers Deer Rarely Browse."
4.05	1. USDA/ARS-GRIN [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?15948. 2. Parsons, W.T. and E.G. Cuthbertson. *Noxious Weeds of Australia* . 2nd ed. Victoria, Australia: CSIRO, 2001. Print. 3. FDA Poisonous Plant Datadase (via numerous references) http://www.accessdata.fda.gov/scripts/plantox/detail.cfm?id=13116. 4.a-c. New South Wales Department of Primary Industries, prepared by S.B. Johnson. 2007. *Review of the declaration of Lantana species in New South Wales* .	1. Vertebrate poison to mammals. 2. Suspected of cattle poisoning, similar to *L. camara* . 3. *L. montevidensis* is present on the FDA Poisonous Plant Database. 4.a. Some authors have indicated that the species is not toxic (Seawright 1965; Dowling & McKenzie 1993). 4.b. O'Donnell (2002) postulated that if cattle had been grazing pasture infested with *L. montevidensis* since birth then resistance or immunity may have been develped whereas introduced cattle may not have this resistance. 4.c. Everist (1981) noted that the toxicity of the specie required further study.
4.06	1. Habeck, D.H. et al. 2007. Lantana Lace Bug, *Teleonemia scrupulosa* Stål (Insecta: Hemiptera: Tingidae). http://edis.ifas.ufl.edu/pdffiles/IN/IN51400.pdf.	1. In East Africa after defoliating lantana, lantana lace bugs moved to sesame (*Sesamum indicum* L.) causing economic losses to the crop (Greathead 1968).
4.07	1. FDA Poisonous Plant Datadase (via numerous references) http://www.accessdata.fda.gov/scripts/plantox/detail.cfm?id=13116.	1. *L. montevidensis* is present on the FDA Poisonous Plant Database.

4.08		
4.09	1. Horticopia professional software. http://www.horticopia.com/. 2. Dehgan, B. *Landscape Plants for Subtropical Climates* . Gainesville: University Press of Florida, 1998. Print. 3. Parsons, W.T. and E.G. Cuthbertson. *Noxious Weeds of Australia* . 2nd ed. Victoria, Australia: CSIRO, 2001. Print. 4. New South Wales Department of Primary Industries, prepared by S.B. Johnson. 2007. *Review of the declaration of Lantana species in New South Wales* .	1. Exposure: full sun. 2. For compact growth and best flowering, full sun. 3. It is an extremely efficient pioneer species. 4. Has the ability to grow and reproduce in situations from full sinlight to shade.
4.10	1. Horticopia professional software. http://www.horticopia.com/. 2. Dehgan, B. *Landscape Plants for Subtropical Climates* . Gainesville: University Press of Florida, 1998. Print. 3. Parsons, W.T. and E.G. Cuthbertson. *Noxious Weeds of Australia* . 2nd ed. Victoria, Australia: CSIRO, 2001. Print. 4. Russ, K. 2004. Lantana. Clemson Extension Home and Garden Information Center. http://www.clemson.edu/extension/hgic/plants/landscape/flowers/hgic1177.html.	1. Sandy, clay, loamy. 2. For compact growth and best flowering, well-drained soil. 3. Subhumid to semi-arid regions of the tropics and subtropics, especially on stony soils readily replacing pasture species affected by prolonged droughts. 4. *Lantana* is tolerant of all soil types provided they are well drained and slighly acidic.
4.11	1. Parsons, W.T. and E.G. Cuthbertson. *Noxious Weeds of Australia* . 2nd ed. Victoria, Australia: CSIRO, 2001. Print.	1. A creeping, trailing or weeping shrub, climbing rocks and along tree branches.
4.12	1. Parsons, W.T. and E.G. Cuthbertson. *Noxious Weeds of Australia* . 2nd ed. Victoria, Australia: CSIRO, 2001. Print. 2. Johnson, S.B. et al. *The problem with Lantana montevidensis (creeping lantana)* , In: *Managing weeds in a changing climate. 15th Australian Weeds Conference, Paper and Proceedings* . 24-28 September 2006, Adelaide, South Australia. Victoria, Australia: Weed Management Society of South Australia, 2006.	1. The presence of creeping lantana thickets reduces the available grazing area. 2. Forms dense low growing thickets invading pastures and many natural ecosystems.
5.01		1. Family: Verbenaceae.
5.02		1. Family: Verbenaceae.
5.03		
5.04		
6.01		
6.02	1.a-b. Parsons, W.T. and E.G. Cuthbertson. *Noxious Weeds of Australia* . 2nd ed. Victoria, Australia: CSIRO, 2001. Print. 2.a-b. Johnson, S.B. et al. *The problem with Lantana montevidensis (creeping lantana)* , In: *Managing weeds in a changing climate. 15th Australian Weeds Conference, Paper and Proceedings* . 24-28 September 2006, Adelaide, South Australia. Victoria, Australia: Weed Management Society of South Australia, 2006.	1.a. Reproducing by seed. 1.b. Seeds may germinate at any time of the year. 2.a. Despite claims to the contrary, all varieties and hybrids of *Lantana* species are fertile to some extent. 2.b. Flowering and fruit set may occur all year, with fruit dispersal by a range of birds and animals.

6.03	1.a-b. Johnson, S.B. et al. *The problem with Lantana montevidensis (creeping lantana)* , In: *Managing weeds in a changing climate. 15th Australian Weeds Conference, Paper and Proceedings* . 24-28 September 2006, Adelaide, South Australia. Victoria, Australia: Weed Management Society of South Australia, 2006.	1.a. Species and hybrids of *Lantana* hybridize freely and many are used in horticulture. 1.b. Apparent potential for the species to cross with other varieties and hybrids to form new *Lantana* species aggregates that may hamper future control measures. The NSW government has declared all *Lantana* species under the Noxious Weed Act 1993 to help prevent species contributing further genetic material to the existing pool.
6.04		
6.05	1. Russ, K. 2004. Lantana. Clemson Extension Home and Garden Information Center. http://www.clemson.edu/extension/hgic/plants/landscape/flowers/hgic1177.html	1. *Lantanas* are very attractive to butterflies.
6.06	1. Parsons, W.T. and E.G. Cuthbertson. *Noxious Weeds of Australia* . 2nd ed. Victoria, Australia: CSIRO, 2001. Print. 2. Johnson, S.B. et al. *The problem with Lantana montevidensis (creeping lantana)* , In: *Managing weeds in a changing climate. 15th Australian Weeds Conference, Paper and Proceedings* . 24-28 September 2006, Adelaide, South Australia. Victoria, Australia: Weed Management Society of South Australia, 2006. 3. 1. New South Wales Department of Primary Industries, prepared by S.B. Johnson. 2007. *Review of the declaration of Lantana species in New South Wales* .	1. Reproducing by layering. 2. Vegetative spread also possible. 3. Swarbrick (1986) noted that the weedy variety may also reproduce by stem cuttings and by the division of established plants.
6.07		Can be grown as an annual.
7.01	1. Parsons, W.T. and E.G. Cuthbertson. *Noxious Weeds of Australia* . 2nd ed. Victoria, Australia: CSIRO, 2001. Print.	1. Creeping lantana seeds are spread widely in mud sticking to footwear.
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.	1. Economic importance: ornamental.
7.03		
7.04		
7.05	1. Parsons, W.T. and E.G. Cuthbertson. *Noxious Weeds of Australia* . 2nd ed. Victoria, Australia: CSIRO, 2001. Print. 2. New South Wales Department of Primary Industries, prepared by S.B. Johnson. 2007. *Review of the declaration of Lantana species in New South Wales* .	1. Creeping lantana seeds are spread widely by water flowing across the soil surface during heavy rain. 2. O'Donnell (2002) also noted that seeds float and that gullies and watercourses were susceptible to infestation as a result.

7.06	1. Parsons, W.T. and E.G. Cuthbertson. *Noxious Weeds of Australia* . 2nd ed. Victoria, Australia: CSIRO, 2001. Print. 2. Johnson, S.B. et al. *The problem with Lantana montevidensis (creeping lantana)* , In: *Managing weeds in a changing climate. 15th Australian Weeds Conference, Paper and Proceedings* . 24-28 September 2006, Adelaide, South Australia. Victoria, Australia: Weed Management Society of South Australia, 2006.	1. Creeping lantana seeds are spread widely by fruit-eating birds. 2. Flowering and fruit set may occur all year, with fruit dispersal by a range of birds.
7.07	1. Parsons, W.T. and E.G. Cuthbertson. *Noxious Weeds of Australia* . 2nd ed. Victoria, Australia: CSIRO, 2001. Print. 2. New South Wales Department of Primary Industries, prepared by S.B. Johnson. 2007. *Review of the declaration of Lantana species in New South Wales* .	1. Creeping lantana seeds are spread widely in mud sticking to hooves. 2. O'Donnell indicated that ants transport and bury seeds in their nests.
7.08	1. Parsons, W.T. and E.G. Cuthbertson. *Noxious Weeds of Australia* . 2nd ed. Victoria, Australia: CSIRO, 2001. Print. 2. Johnson, S.B. et al. *The problem with Lantana montevidensis (creeping lantana)* , In: *Managing weeds in a changing climate. 15th Australian Weeds Conference, Paper and Proceedings* . 24-28 September 2006, Adelaide, South Australia. Victoria, Australia: Weed Management Society of South Australia, 2006. 3. New South Wales Department of Primary Industries, prepared by S.B. Johnson. 2007. *Review of the declaration of Lantana species in New South Wales* .	1. Creeping lantana seeds are spread widely by fruit-eating animals. 2. Flowering and fruit set may occur all year, with fruit dispersal by a range of animals. 3. *L. montevidensis* is also spread when viable seeds pass through the digestive tracts of grazing cattle (O'Donnell 2002).
8.01	1. New South Wales Department of Primary Industries, prepared by S.B. Johnson. 2007. *Review of the declaration of Lantana species in New South Wales* .	1. Various authors including Henderson (1969) stated that the weedy variety have a high production of fertile seeds. For example, O'Donnell (2002) found that yearly seed production varied between 4,964 and 5,175/m^2.
8.02	1. New South Wales Department of Primary Industries, prepared by S.B. Johnson. 2007. *Review of the declaration of Lantana species in New South Wales* .	1. O'Donnell and Panetta (2000) indicated that the viability of seeds decreased to between 30-44% after one year of burial at 1-2 cm of depth while those planted on the soil surface had only 10-18% of viability after a similar time. O'Donnell added (2002) that all surface sown seed was dead after two years but that up to 20% of buried seed was still viable. These results indicate that the seed is relatively short lived in the soil.
8.03	1. Parsons, W.T. and E.G. Cuthbertson. *Noxious Weeds of Australia* . 2nd ed. Victoria, Australia: CSIRO, 2001. Print.	1. Spray with dichlorprop, repeating the spraying as required to cope with seedling growth to actively growing plants in late summer or autumn. Fosamine, glufosinate, imazapyr, and triclopyr have also given useful control in experiments.

8.04	1.a-b. Russ, K. 2004. Lantana. Clemson Extension Home and Garden Information Center. http://www.clemson.edu/extension/hgic/plants/landscape/flowers/hgic1177.html.	1.a. *Lantanas* generally grow rapidly and tolerate trimming back well during the growing season. 1.b. Plants can be pruned back by up to a third of their height and spread. Prune perennial *Lantanas* back hard to remove old growth.
8.05	1. New South Wales Department of Primary Industries, prepared by S.B. Johnson. 2007. *Review of the declaration of Lantana species in New South Wales* .	1. In Australia the impact of these agents is limited. Biological control agents that were released to control *L. camara* and also attacked *L. montevidensis* : a flower feeding moth native to the southern U.S., *Lantanophaga pusillidactyla* ; and a leaf blotching fly was observed severely mining leaves of *L. camara* throughout the year in south Florida (Stegmaier 1967).