

Australia/New Zealand Weed Risk Assessment adapted for Florida.

Data used for analysis published in: Gordon, D.R., D.A. Onderdonk, A.M. Fox, R.K. Stocker, and C. Gantz. 2008. Predicting Invasive Plants in Florida using the Australian Weed Risk Assessment. Invasive Plant Science and Management 1: 178-195.

<i>Hyptis pectinata (comb bushmint)</i>			
Question number	Question	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)	2	
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high)	2	
2.03	Broad climate suitability (environmental versatility)		
2.04	Native or naturalized in habitats with periodic inundation		
2.05	Does the species have a history of repeated introductions outside its natural range?	y	
3.01	Naturalized beyond native range	y	0
3.02	Garden/amenity/disturbance weed	y	0
3.03	Weed of agriculture	y	0
3.04	Environmental weed	n	0
3.05	Congeneric weed	y	0
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	n	0
4.06	Host for recognised pests and pathogens		
4.07	Causes allergies or is otherwise toxic to humans	n	0
4.08	Creates a fire hazard in natural ecosystems	n	0
4.09	Is a shade tolerant plant at some stage of its life cycle		
4.1	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils)		
4.11	Climbing or smothering growth habit	n	0
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		
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 fragmentation	n	-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	n	-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	n	-1
7.06	Propagules bird dispersed	n	-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	y	1
8.02	Evidence that a persistent propagule bank is formed (>1 yr)		
8.03	Well controlled by herbicides	y	-1
8.04	Tolerates, or benefits from, mutilation or cultivation		
8.05	Effective natural enemies present in Florida, or east of the continental divide		
Total Score			11

Outcome	Reject*
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*Used secondary screen from: Daehler, C. C., J.L. Denslow, S. Ansari, and H. Kuo. 2004. A risk assessment system for screening out harmful invasive pest plants from Hawaii's and other Pacific islands. *Conserv. Biol.* 18: 360-368.

section	# questions answered	satisfy minimum?
A	6	yes
B	9	yes
C	17	yes
total	32	yes

Data collected 2006-2007

Question number	Reference	Source data
1.01		no evidence of cultivation
1.02		
1.03		
2.01		
2.02		
2.03		
2.04		
2.05	Lemmens and Bunyaphatsara, eds. (2003) Plant Resources of South-East Asia. No. 12. Medicinal and poisonous plants 3. Backhuys Publishers, Leiden.	"Native to tropical America, but naturalized in many other tropical regions"
3.01	1. Lemmens and Bunyaphatsara, eds. (2003) Plant Resources of South-East Asia. No. 12. Medicinal and poisonous plants 3. Backhuys Publishers, Leiden. 2. Wagner, Herbst, and Sohmer (1999) Manual of the flowering plants of Hawai'i. University of Hawai'i Press/Bishop Museum Press, Honolulu.	1. "Native to tropical America, but naturalized in many other tropical regions; in Malesia found in West Java and New Guinea." 2. "Native to tropical America, widely naturalized; in Hawai'i naturalized in low elevation, dry to mesic, disturbed habitats"
3.02	Soria, Taylor, Tye, and Wilkinson (2002) Manual de identificacion y manejo de malezas en Galapagos. Charles Darwin Research Station, Puerta Ayora, Galapagos, Ecuador. 66 pp. (http://www.darwinfoundation.org/downloads/guia_ID_Manejo_Malezas.pdf).	"Grows in disturbed areas, principally on roadsides. It is a species that is always invading new areas of the National Park." [From the first sentence, we are assuming it invades disturbed areas of the National Park and not natural areas.]
3.03	1. Smith (1991) Flora Vitiensis Nova: A New Flora of Fiji. Vol. 5. Pacific Tropical Botanical Garden. 2. Holm (1979) A Geographical Atlas of World Weeds. John Wiley and Sons.	1. "In Fiji <i>Hyptis pectinata</i> is seen from near sea level to about 200 m. as a vigorous and aggressive weed of agricultural, pastoral, and plantation lands"; "by the 1930's [<i>H. pectinata</i>] had become such an agricultural pest as to be declared a noxious weed". 2. Considered a principal weed of agriculture in Fiji, and a common weed in Hawaii and Puerto Rico.

3.04		no evidence
3.05	Parsons and Cuthbertson (2001) Noxious Weeds of Australia. CSIRO Publishing.	<i>Hyptis capitata</i> and <i>H. suaveolens</i> are considered noxious weeds in Australia.
4.01	Lemmens and Bunyapraphatsara, eds. (2003) Plant Resources of South-East Asia. No. 12. Medicinal and poisonous plants 3. Backhuys Publishers, Leiden.	no description of these traits
4.02		no evidence
4.03	Lemmens and Bunyapraphatsara, eds. (2003) Plant Resources of South-East Asia. No. 12. Medicinal and poisonous plants 3. Backhuys Publishers, Leiden.	no description of this
4.04	Whistler (1995) Wayside Plants of the Islands. Isle Botanica, Honolulu.	"It is a serious pest, particularly in pastures, since cattle do not eat it."
4.05		no evidence
4.06		
4.07	Lemmens and Bunyapraphatsara, eds. (2003) Plant Resources of South-East Asia. No. 12. Medicinal and poisonous plants 3. Backhuys Publishers, Leiden.	"The leaves are also used for flavouring soup." [and no evidence of toxicity or allergenicity]
4.08		no evidence
4.09		
4.1		
4.11	Lemmens and Bunyapraphatsara, eds. (2003) Plant Resources of South-East Asia. No. 12. Medicinal and poisonous plants 3. Backhuys Publishers, Leiden.	"a large, shrubby herb up to 250 cm tall"
4.12	Csurhes and Edwards (1998) Potential Environmental Weeds in Australia. Queensland Department of Natural Resources.	"Chemical control has been effective against large thickets in Fiji (Anon. 1981)." [so it must produce thickets]
5.01		terrestrial
5.02	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	Lamiaceae
5.03	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	Lamiaceae
5.04		
6.01		
6.02	Lorenzi (2000) Plantas Daninhas do Brasil. Instituto Plantarum.	"propagates solely by seed"
6.03		
6.04		
6.05	Lemmens and Bunyapraphatsara, eds. (2003) Plant Resources of South-East Asia. No. 12. Medicinal and poisonous plants 3. Backhuys Publishers, Leiden.	The genus <i>Hyptis</i> usually has "an explosive pollination mechanism, powdering visiting insects from below with pollen".
6.06	Lorenzi (2000) Plantas Daninhas do Brasil.	"propagates solely by seed"

	Instituto Plantarum.	
6.07	Lorenzi (2000) Plantas Daninhas do Brasil. Instituto Plantarum.	"Flowering occurs in the fall, after a growth cycle of approximately 100 days."
7.01	Csurhes and Edwards (1998) Potential Environmental Weeds in Australia. Queensland Department of Natural Resources.	"The seeds are probably transported long distances in mud on vehicles and machinery (Waterhouse pers. comm.)"
7.02		no evidence of cultivation
7.03		no evidence
7.04	Soria, Taylor, Tye, and Wilkinson (2002) Manual de identificacion y manejo de malezas en Galapagos. Charles Darwin Research Station, Puerta Ayora, Galapagos, Ecuador. 66 pp. (http://www.darwinfoundation.org/downloads/guia_ID_Manejo_Malezas.pdf).	" <i>Hyptis pectinata</i> produces numerous and small seeds that are easily dispersed by the wind."
7.05		no evidence
7.06		wind dispersed
7.07	Csurhes and Edwards (1998) Potential Environmental Weeds in Australia. Queensland Department of Natural Resources.	"The seeds are probably transported long distances...by sticking to the fur of animals (Whistler 1983)."
7.08		wind dispersed
8.01	Csurhes and Edwards (1998) Potential Environmental Weeds in Australia. Queensland Department of Natural Resources.	"prolific tiny seeds"
8.02		
8.03	1. Soria, Taylor, Tye, and Wilkinson (2002) Manual de identificacion y manejo de malezas en Galapagos. Charles Darwin Research Station, Puerta Ayora, Galapagos, Ecuador. 66 pp. (http://www.darwinfoundation.org/downloads/guia_ID_Manejo_Malezas.pdf). 2. Csurhes and Edwards (1998) Potential Environmental Weeds in Australia. Queensland Department of Natural Resources.	1. Foliar or basal bark application of Roundup (3% concentration in water) is effective. 2. "Chemical control has been effective against large thickets in Fiji (Anon. 1981)."
8.04		
8.05		