Australia/New Zealand Weed Risk Assessment adapted for United States.

Data used for analysis published in: Gordon, D.R. and C.A. Gantz. 2008. Potential impacts on the horticultural industry of screening new plants for invasiveness. Conservation Letters 1: 227-235. Available at: http://www3.interscience.wiley.com/cgi-bin/fulltext/121448369/PDFSTART

Livistona concinna			
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 U.S. 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)	?	
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	n	-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		
4.01	Produces spines, thorns or burrs	y	1
4.02	Allelopathic		
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals		
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	?	
4.09	Is a shade tolerant plant at some stage of its life cycle		
4.1	Grows on one or more of the following soil types: alfisols, entisols, or mollisols	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	n	0
6.02	Produces viable seed		
6.03	Hybridizes naturally	?	
6.04	Self-compatible or apomictic	n	-1
6.05	Requires specialist pollinators		
6.06	Reproduction by vegetative fragmentation		
6.07	Minimum generative time (years)		
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	n	-1
7.04	Propagules adapted to wind dispersal	n	-1
7.05	Propagules water dispersed		
7.06	Propagules bird dispersed	?	
7.07	Propagules dispersed by other animals (externally)	n	-1
7.08	Propagules dispersed by other animals (internally)		
8.01	Prolific seed production		
8.02	Evidence that a persistent propagule bank is formed (>1 yr)		
8.03	Well controlled by herbicides		
8.04	Tolerates, or benefits from, mutilation or cultivation		
8.05	Effective natural enemies present in U.S.		
Total Score			-3

Outcome	**Accept**

section	**# questions answered**	**satisfy minimum?**
A	9	Yes
B	6	Yes
C	10	Yes
total	25	yes

Data collected 2008

Question number	Reference	Source data
1.01		used horticulturally, but no evidence of significant modification
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. Global Biodiversity Information Facility (http://data.gbif.org/species/15052353). 3. Dowe, JL and Barfod, AS (2001) New species of Livistona R. Br. (Arecaceae) from north Queensland and Papua New Guinea. Austrobaileya 6(1): 165-174.	1. Global hardiness zones 9-12. 2. Species occurs in Queensland. 3. "Distribution and habitat: Australia. Queensland: Flinders Island, drainage area of the Kennedy River and tributaries, Barrett Creek and along the Endeavour River north of Cooktown and Archer Point south of Cooktown".
2.02		
2.03	1. Köppen-Geiger climate map (http://www.hydrol-earth-syst-sci.net/11/1633/2007/hess-11-1633-2007.pdf). 2. Global Biodiversity Information Facility (http://data.gbif.org/species/15052353). 3. Dowe, JL and Barfod, AS (2001) New species of Livistona R. Br. (Arecaceae) from north Queensland and Papua New Guinea. Austrobaileya 6(1): 165-174.	1. Distribution range is uncertain -- possibly three climatic regions. 2. Species occurs in Queensland. 3. "Distribution and habitat: Australia. Queensland: Flinders Island, drainage area of the Kennedy River and tributaries, Barrett Creek and along the Endeavour River north of Cooktown and Archer Point south of Cooktown".
2.04	Microsoft Encarta World Precipitation and Average Rainfall (http://uk.encarta.msn.com/encnet/RefPages/RefMedia.aspx?refid=461530746&artrefid=761554737&pn=3&sec=-1).	For Queensland, the average annual precipitation is over 80 inches/year.
2.05	1. Palms for Brisbane (http://www.palmsforbrisbane.com.au/PriceList/Default.aspx?PlantCategoryId=6). 2. Palm Plantations of Australia (http://www.palmplantations.com.au/other/seedlings.htm). 3. Philip Redhead (http://www.philipredhead.com/pdf/Price_List_Sept_2006.pdf). 4. Burringbar Botanic	1, 2, 3. Sold internationally from Australia. 4. Planted at Burringbar Botanic Gardens Arboretum in Australia.

	Gardens Arboretum (http://www.botanicgardensnursery.com/documents/BurringbarBotanicGardensArboretumList.pdf).	
3.01		no evidence
3.02		no evidence
3.03		no evidence
3.04		no evidence
3.05		
4.01	Dowe, JL and Barfod, AS (2001) New species of *Livistona* R. Br. (Arecaceae) from north Queensland and Papua New Guinea. Austrobaileya 6(1): 165-174.	"Margins with solitary symmetric black spines 3-5 mm long congested in the proximal portion with distal margins unarmed, sharp, slightly winged".
4.02		
4.03	Dowe, JL and Barfod, AS (2001) New species of *Livistona* R. Br. (Arecaceae) from north Queensland and Papua New Guinea. Austrobaileya 6(1): 165-174.	no description of parasitism
4.04		
4.05	Dowe, JL and Barfod, AS (2001) New species of *Livistona* R. Br. (Arecaceae) from north Queensland and Papua New Guinea. Austrobaileya 6(1): 165-174.	no evidence
4.06		
4.07	Dowe, JL and Barfod, AS (2001) New species of *Livistona* R. Br. (Arecaceae) from north Queensland and Papua New Guinea. Austrobaileya 6(1): 165-174.	no evidence
4.08	Dowe, JL and Barfod, AS (2001) New species of *Livistona* R. Br. (Arecaceae) from north Queensland and Papua New Guinea. Austrobaileya 6(1): 165-174.	"Most populations are regularly affected by fire."
4.09		
4.1	1. USDA, National Resources Conservation Services (NRCS), Soil Survey Division, World Soil Resources (http://soils.usda.gov/use/worldsoils/mapindex/order.html). 2. Dowe, JL and Barfod, AS (2001) New species of Livistona R. Br. (Arecaceae) from north Queensland and Papua New Guinea. Austrobaileya 6(1):	1. Australia, Queensland (NE): the region of origin contains aridisols, entisols, and ultisols (and also oxisols). 2. "Soils are usually alluvial".

	165-174.	
4.11	1. Dowe, JL and Barfod, AS (2001) New species of Livistona R. Br. (Arecaceae) from north Queensland and Papua New Guinea. Austrobaileya 6(1): 165-174. 2. Foreman, DB and Walsh, NG (Editors) (1993) *Livistona*. P. 166. In: Flora of Victoria. Volume 2: Ferns and Allied Plants, Conifers and Monocotyledons. Inkata Press, Melbourne, Victoria. 3. ZipcodeZoo.com (http://zipcodezoo.com/Plants/L/Livistona_concinna.asp).	1. "Trunk to 30 m tall, with diameter at breast height 24-35 cm, expanded at the base to 100 cm diam." 2. "Palm-tree. Trunk unbrached, straight…Leaves forming a dense crown at apex of trunk" [genus description]. 3. "Plants small to large. Stems solitary, erect, slender (rarely) to robust (more than 20 cm diam.)" [genus description].
4.12	1. Dowe, JL and Barfod, AS (2001) New species of Livistona R. Br. (Arecaceae) from north Queensland and Papua New Guinea. Austrobaileya 6(1): 165-174. 2. Foreman, DB and Walsh, NG (Editors) (1993) *Livistona*. P. 166. In: Flora of Victoria. Volume 2: Ferns and Allied Plants, Conifers and Monocotyledons. Inkata Press, Melbourne, Victoria. 3. ZipcodeZoo.com (http://zipcodezoo.com/Plants/L/Livistona_concinna.asp).	1. "Trunk to 30 m tall, with diameter at breast height 24-35 cm, expanded at the base to 100 cm diam." 2. "Palm-tree. Trunk unbrached, straight…Leaves forming a dense crown at apex of trunk" [genus description]. 3. "Plants small to large. Stems solitary, erect, slender (rarely) to robust (more than 20 cm diam.)" [genus description].
5.01		terrestrial
5.02		Arecaceae
5.03		Arecaceae
5.04	1. Dowe, JL and Barfod, AS (2001) New species of Livistona R. Br. (Arecaceae) from north Queensland and Papua New Guinea. Austrobaileya 6(1): 165-174. 2. Foreman, DB and Walsh, NG (Editors) (1993) *Livistona*. P. 166. In: Flora of Victoria. Volume 2: Ferns and Allied Plants, Conifers and Monocotyledons. Inkata Press, Melbourne, Victoria. 3. ZipcodeZoo.com (http://zipcodezoo.com/Plants/L/Livistona_concinna.asp).	1. "Trunk to 30 m tall, with diameter at breast height 24-35 cm, expanded at the base to 100 cm diam." 2. "Palm-tree. Trunk unbrached, straight…Leaves forming a dense crown at apex of trunk" [genus description]. 3. "Plants small to large. Stems solitary, erect, slender (rarely) to robust (more than 20 cm diam.)" [genus description].
6.01	Dowe, JL and Barfod, AS (2001) New species of *Livistona* R. Br. (Arecaceae) from north Queensland and Papua New Guinea. Austrobaileya 6(1): 165-174.	no evidence
6.02		

6.03	Dowe, JL and Barfod, AS (2001) New species of *Livistona* R. Br. (Arecaceae) from north Queensland and Papua New Guinea. Austrobaileya 6(1): 165-174.	"Although *L. concinna* occurs with *L. muelleri* in some locations, we have not detected, at least by visual means, any putative hybrids between the two."
6.04	Dowe, JL and Barfod, AS (2001) New species of *Livistona* R. Br. (Arecaceae) from north Queensland and Papua New Guinea. Austrobaileya 6(1): 165-174.	"Solitary, functionally dioecious palm."
6.05		
6.06		
6.07		
7.01		
7.02	1. Palms for Brisbane (http://www.palmsforbrisbane.com.au/PriceList/Default.aspx?PlantCategoryId=6). 2. Palm Plantations of Australia (http://www.palmplantations.com.au/other/seedlings.htm). 3. Philip Redhead (http://www.philipredhead.com/pdf/Price_List_Sept_2006.pdf). 4. Burringbar Botanic Gardens Arboretum (http://www.botanicgardensnursery.com/documents/BurringbarBotanicGardensArboretumList.pdf).	1, 2, 3. Sold internationally from Australia. 4. Planted at Burringbar Botanic Gardens Arboretum in Australia.
7.03		no evidence
7.04	1. Dowe, JL and Barfod, AS (2001) New species of Livistona R. Br. (Arecaceae) from north Queensland and Papua New Guinea. Austrobaileya 6(1): 165-174. 2. Wheeler, JR, Rye, BL, Koch, BL, and Wilson, AJG (1992) Flora of the Kimberley Region. Western Australian Herbarium, Department of Conservation and Land Management, Como, Western Australia. 3. ZipcodeZoo.com (http://zipcodezoo.com/Plants/L/Livistona_concinna.asp).	1. "Fruit globose, 9-12 mm diam., shiny black...mesocarp c. 1 mm thick, moist, oily and gritty in texture...Seed globose to subglobose; seedcoat intrusion extending to half or less of the width of the seed". 2. "Fruit a dry or succulent drupe" [genus description]. 3. "Fruits drupes; exocarp blackish, smooth; mesocarp fleshy; endocarp bony. Seeds globose or ellipsoid; endosperm homogeneous" [genus description]. [no evidence of adaptations to wind dispersal]
7.05		
7.06	Dowe, JL and Barfod, AS (2001) New species of Livistona R. Br. (Arecaceae) from north Queensland and Papua New Guinea. Austrobaileya 6(1): 165-174.	Fruit globose, 9-12 mm diam., shiny black...mesocarp c. 1 mm thick, moist, oily and gritty in texture...Seed globose to subglobose; seedcoat intrusion extending to half or less of the width of the seed.
7.07	1. Dowe, JL and Barfod, AS (2001) New	1. "Fruit globose, 9-12 mm diam., shiny

	species of Livistona R. Br. (Arecaceae) from north Queensland and Papua New Guinea. Austrobaileya 6(1): 165-174. 2. Wheeler, JR, Rye, BL, Koch, BL, and Wilson, AJG (1992) Flora of the Kimberley Region. Western Australian Herbarium, Department of Conservation and Land Management, Como, Western Australia. 3. ZipcodeZoo.com (http://zipcodezoo.com/Plants/L/Livistona_concinna.asp).	black...mesocarp c. 1 mm thick, moist, oily and gritty in texture...Seed globose to subglobose; seedcoat intrusion extending to half or less of the width of the seed". 2. "Fruit a dry or succulent drupe" [genus description]. 3. "Fruits drupes; exocarp blackish, smooth; mesocarp fleshy; endocarp bony. Seeds globose or ellipsoid; endosperm homogeneous" [genus description]. [no evidence of adaptations to external dispersal]
7.08		
8.01		
8.02		
8.03		
8.04		
8.05		