Keywords: Low Risk, Subtropical Bamboo, Edible, Ornamental, Clumping

Family: Poaceae

Print Date: 5/8/2013

Taxon: Drepanostachyum khasianum

Synonym: Arundinaria khasiana Munro Common Name: Khasia bamboo

Arundinaria suberecta Munro

Chimonobambusa khasiana (Munro) Nakai

_	estionaire : tus:	current 20090513 Assessor Approved	Assessor:	Assessor	Designation: L	
			Data Entry Person:	ASSESSOF	WRA Score 0	
01	Is the species hi	ghly domesticated?			y=-3, n=0	n
02	Has the species become naturalized where grown?				y=1, n=-1	
03	Does the species	s have weedy races?			y=1, n=-1	
01	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical" $\frac{1}{2}$			(0-low; 1-intermediate; 2-high) (See Appendix 2)	High	
02	Quality of climate match data			(0-low; 1-intermediate; 2-high) (See Appendix 2)	High	
03	Broad climate s	uitability (environmental ve	ersatility)		y=1, n=0	n
04	Native or natur	alized in regions with tropic	al or subtropical climates		y=1, n=0	y
05	Does the species	s have a history of repeated	introductions outside its na	tural range?	y=-2, ?=-1, n=0	n
01	Naturalized bey	ond native range			y = 1*multiplier (see Appendix 2), n= question 205	n
02	Garden/amenit	y/disturbance weed			n=0, y = 1*multiplier (see Appendix 2)	n
03	Agricultural/forestry/horticultural weed				n=0, y = 2*multiplier (see Appendix 2)	n
04	Environmental weed				n=0, y = 2*multiplier (see Appendix 2)	n
05	Congeneric weed			n=0, y = 1*multiplier (see Appendix 2)	n	
01	Produces spines	s, thorns or burrs			y=1, n=0	n
02	Allelopathic				y=1, n=0	
03	Parasitic				y=1, n=0	n
04	Unpalatable to	grazing animals			y=1, n=-1	n
05	Toxic to animal	s			y=1, n=0	n
06	Host for recognized pests and pathogens				y=1, n=0	
07	Causes allergies or is otherwise toxic to humans				y=1, n=0	n
08	Creates a fire h	azard in natural ecosystems			y=1, n=0	
09	Is a shade toler	ant plant at some stage of its	s life cycle		y=1, n=0	y
10	Tolerates a wid	e range of soil conditions (or	· limestone conditions if not	a volcanic island)	y=1, n=0	y

411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	n
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	y
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs bulbs, corms	, or tubers) y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally	y=1, n=-1	
604	Self-compatible or apomictic	y=1, n=-1	
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	>3
701	$\label{propagates} \textbf{Propagules likely to be dispersed unintentionally (plants growing in hear areas)}$	vily trafficked y=1, n=-1	n
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal	y=1, n=-1	
705	Propagules water dispersed	y=1, n=-1	n
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	
801	Prolific seed production (>1000/m2)	y=1, n=-1	
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	
803	Well controlled by herbicides	y=-1, n=1	
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	y
805	Effective natural enemies present locally (e.g. introduced biocontrol age	nts) y=-1, n=1	
	De	esignation: L WRA Score 0	

Supporting Data:			
101	1994. Stapleton, C.M.A The bamboos of Nepal and Bhutan Part I: Bambusa, Dendrocalamus, Melocanna, Cephalostachyum, Teinostachyum, and Pseudostachyum (Gramineae: Poaceae, Bambusoideae). Edinburgh Journal of Botany. 51(1): 1-32.	[Is the species highly domesticated? No] No evidence	
102	2013. WRA Specialist. Personal Communication.	NA	
103	2013. WRA Specialist. Personal Communication.	NA	
201	1994. Stapleton, C.M.A The bamboos of Nepal and Bhutan Part I: Bambusa, Dendrocalamus, Melocanna, Cephalostachyum, Teinostachyum, and Pseudostachyum (Gramineae: Poaceae, Bambusoideae). Edinburgh Journal of Botany. 51(1): 1-32.	[Species suited to tropical or subtropical climate(s) 2-High] "Drepanostachyum species are forest understorey plants of warm broad leaved subtropical forest types such as Schima–Castanopsis, although a few species are also cultivated. They will not survive below about 500m, where absolute maximum temperatures rise to c.40°C."	
202	1994. Stapleton, C.M.A The bamboos of Nepal and Bhutan Part I: Bambusa, Dendrocalamus, Melocanna, Cephalostachyum, Teinostachyum, and Pseudostachyum (Gramineae: Poaceae, Bambusoideae). Edinburgh Journal of Botany. 51(1): 1-32.	[Quality of climate match data 2-High]	
203	1994. Stapleton, C.M.A The bamboos of Nepal and Bhutan Part I: Bambusa, Dendrocalamus, Melocanna, Cephalostachyum, Teinostachyum, and Pseudostachyum (Gramineae: Poaceae, Bambusoideae). Edinburgh Journal of Botany. 51(1): 1-32.	[Broad climate suitability (environmental versatility)? No] "They will not survive below about 500m, where absolute maximum temperatures rise to c.40°C. They are progressively replaced by species of Himalayacalamus above 1850m, as their leaves are damaged by winter temperatures below c.–5°C, and by the higher UV content of strong insolation at higher altitudes."	
204	1994. Stapleton, C.M.A The bamboos of Nepal and Bhutan Part I: Bambusa, Dendrocalamus, Melocanna, Cephalostachyum, Teinostachyum, and Pseudostachyum (Gramineae: Poaceae, Bambusoideae). Edinburgh Journal of Botany. 51(1): 1-32.	[Native or naturalized in regions with tropical or subtropical climates? Yes] "Drepanostachyum species are mainly found in subtropical forests." "Distribution: India (Meghalaya), Bhutan."	
205	1994. Stapleton, C.M.A The bamboos of Nepal and Bhutan Part I: Bambusa, Dendrocalamus, Melocanna, Cephalostachyum, Teinostachyum, and Pseudostachyum (Gramineae: Poaceae, Bambusoideae). Edinburgh Journal of Botany. 51(1): 1-32.	[Does the species have a history of repeated introductions outside its natural range? No] "With the exception of D. intermedium, most species are not widely cultivated or harvested, and are not of great economic importance."	
301	2012. Randall, R.P A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Naturalized beyond native range? No] No evidence	
302	2012. Randall, R.P A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Garden/amenity/disturbance weed? No] No evidence	
303	2012. Randall, R.P A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Agricultural/forestry/horticultural weed? No] No evidence	
304	2012. Randall, R.P A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Environmental weed? No] No evidence	
805	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Congeneric weed? No] No evidence	
401	1994. Stapleton, C.M.A Bamboos of Nepal. Royal Botanic Gardens Kew / Overseas Development Administration Forestry Research Programme, Oxford, UK	[Produces spines, thorns or burrs? No] "Clump-forming thornless bamboos up to 5m tall with many branches," [Genus description]	

2006 (onwards). Clayton, W.D./Vorontsova,	TO 1 ON THE STATE OF THE STATE
2006 (onwards). Clayton, W.D./Vorontsova, M.S./Harman, K.T./Williamson, H GrassBas The Online World Grass Flora. http://www.kew.org/data/grasses-db.html	[Produces spines, thorns or burrs? No] "Perennial; caespitose. Rhizomes short; pachymorph. Culms erect; 250–400 cm long; 12 mm diam.; woody. Culminternodes terete; 15–20 cm long; dark green, or black; smooth. Lateral branches dendroid. Branch complement many; with subequal branches. Culm-sheaths 15–23 cm long; 4–5 times as long as wide; chartaceous; smooth; concave at apex. Culm-sheath ligule 5–7 mm high; dentate. Culm-sheath blade linear; reflexed; 2.5 cm long. Leaf-sheaths striately veined. Ligule an eciliate membrane; obtuse, or acute. Leaf-blade base with a brief petiole like connection to sheath. Leaf-blades deciduous at the ligule; linear, or lanceolate; 7–10 cm long; 7–8 mm wide; glandular. Leaf-blade midrib conspicuous. Leaf-blade venation with 4–6 secondary veins; without cross veins. Leaf blade surface smooth; glabrous, or pubescent; hairy abaxially. Leaf-blade margins scabrous. Leaf-blade apex attenuate; filiform."
2013. WRA Specialist. Personal Communica	tion. [Allelopathic? Unknown]
2006 (onwards). Clayton, W.D./Vorontsova, M.S./Harman, K.T./Williamson, H GrassBas The Online World Grass Flora. http://www.kew.org/data/grasses-db.html	[Parasitic? No] Poaceae se -
14 1994. Stapleton, C.M.A Bamboos of Nepal. Royal Botanic Gardens Kew / Overseas Development Administration Forestry Resear Programme, Oxford, UK	foliage is often fed to animals or browsed in the forest." [Genus description] "It
2005. CAB International. Forestry Compendic CAB International, Wallingford, UK	um. [Unpalatable to grazing animals? No] "They are harvested from natural forest and also cultivated, providing culms for basketry and light furniture, and winter fodder for stall fed livestock"
1994. Stapleton, C.M.A Bamboos of Nepal. Royal Botanic Gardens Kew / Overseas Development Administration Forestry Resear Programme, Oxford, UK	below 1 cm in diameter and 3 m in height, although like other Drepanostachyum
2005. CAB International. Forestry Compendin CAB International, Wallingford, UK	um. [Toxic to animals? No] "They are harvested from natural forest and also cultivated, providing culms for basketry and light furniture, and winter fodder for stall fed livestock" [Information for related D. falcatum]
2006. Quattrocchi, U CRC World Dictionary Grasses: Common Names, Scientific Names Eponyms, Synonyms, and Etymolog. CRC Pl Boca Raton, FL	i, livestock" [Genus description. No evidence of toxicity]
2011. Benton, A./Thomson, L./Berg, P./Rusk S Farm and Forestry Production and Marke Profile for Bamboo (various species). In Elev C.R. (ed.) Specialty Crops for Pacific Island Agroforestry. Permanent Agriculture Resourc (PAR), Holualoa, HI	ting diseases are reported in the Pacific, but many are found on bamboos in tropical itch, and subtropical Asia."
1994. Stapleton, C.M.A Bamboos of Nepal. Royal Botanic Gardens Kew / Overseas Development Administration Forestry Resear Programme, Oxford, UK	protected or adequately managed, this bamboo is regularly harvested," [No
2008. Wagstaff, D.J International poisonous plants checklist: an evidence-based referenc CRC Press, Boca Raton, FL	
18 1994. Stapleton, C.M.A Bamboos of Nepal. Royal Botanic Gardens Kew / Overseas Development Administration Forestry Resear Programme, Oxford, UK	
1994. Stapleton, C.M.A The bamboos of Ne and Bhutan Part I: Bambusa, Dendrocalamus Melocanna, Cephalostachyum, Teinostachyu and Pseudostachyum (Gramineae: Poaceae, Bambusoideae). Edinburgh Journal of Botang 51(1): 1-32.	s, "Drepanostachyum species are forest understorey plants of warm broad-leaved um, subtropical forest types such as Schima–Castanopsis, although a few species are also cultivated."
2013. Backyard Gardener. Drepanostachyum khasianum. http://www.backyardgardener.com/plantname_ac1a.html [Accessed 08 May 2013]	Range: Sandy Loam to Clay Loam"

411	1994. Stapleton, C.M.A The bamboos of Nepal and Bhutan Part I: Bambusa, Dendrocalamus, Melocanna, Cephalostachyum, Teinostachyum, and Pseudostachyum (Gramineae: Poaceae, Bambusoideae). Edinburgh Journal of Botany. 51(1): 1-32.	[Climbing or smothering growth habit? No] Genus - "Clumps unicaespitose, rhizomes pachymorph with necks less than 25cm long." Speices - "Leaf sheath auricles >2mm across"
412	1994. Stapleton, C.M.A Bamboos of Nepal. Royal Botanic Gardens Kew / Overseas Development Administration Forestry Research Programme, Oxford, UK	[Forms dense thickets? No] "Clump-forming thornless bamboos up to 5m tall with many branches," [Genus] "It is the most common forest bamboo species between 1000 m and 2000 m" [Species. No evidence that this clump forming species forms thickets in native range]
501	1994. Stapleton, C.M.A The bamboos of Nepal and Bhutan Part I: Bambusa, Dendrocalamus, Melocanna, Cephalostachyum, Teinostachyum, and Pseudostachyum (Gramineae: Poaceae, Bambusoideae). Edinburgh Journal of Botany. 51(1): 1-32.	[Aquatic? No] "They occupy a large but discontinuous and fragmented habitat, repeatedly interrupted by hot dry valleys and temperate ridges where they cannot survive."
502	1994. Stapleton, C.M.A The bamboos of Nepal and Bhutan Part I: Bambusa, Dendrocalamus, Melocanna, Cephalostachyum, Teinostachyum, and Pseudostachyum (Gramineae: Poaceae, Bambusoideae). Edinburgh Journal of Botany. 51(1): 1-32.	[Grass? Yes] Poaceae
503	1994. Stapleton, C.M.A The bamboos of Nepal and Bhutan Part I: Bambusa, Dendrocalamus, Melocanna, Cephalostachyum, Teinostachyum, and Pseudostachyum (Gramineae: Poaceae, Bambusoideae). Edinburgh Journal of Botany. 51(1): 1-32.	[Nitrogen fixing woody plant? No] Poaceae
504	1994. Stapleton, C.M.A The bamboos of Nepal and Bhutan Part I: Bambusa, Dendrocalamus, Melocanna, Cephalostachyum, Teinostachyum, and Pseudostachyum (Gramineae: Poaceae, Bambusoideae). Edinburgh Journal of Botany. 51(1): 1-32.	[Geophyte (herbaceous with underground storage organs bulbs, corms, or tubers)? No] "Perennial; caespitose. Rhizomes short; pachymorph. Culms erect; 250–400 cm long; 12 mm diam.; woody. Culm-internodes terete; 15–20 cm long; dark green, or black; smooth. Lateral branches dendroid."
504	2010. Gordon, D.R./Mitterdorfer, B./Pheloung, P.C. et al Guidance for addressing the Australian Weed Risk Assessment questions. Plant Protection Quarterly. 25(2): 56-74.	[Geophyte (herbaceous with underground storage organs bulbs, corms, or tubers)? No] "This question relates to perennial plants with tubers, corms or bulbs. This question is specifically to deal with plants that have specialized organs and should not include plants merely with rhizomes/ stolons"
601	1994. Stapleton, C.M.A The bamboos of Nepal and Bhutan Part I: Bambusa, Dendrocalamus, Melocanna, Cephalostachyum, Teinostachyum, and Pseudostachyum (Gramineae: Poaceae, Bambusoideae). Edinburgh Journal of Botany. 51(1): 1-32.	[Evidence of substantial reproductive failure in native habitat? No]
602	2006-2013. Stapleton, C.M.A Bamboo Identification. http://bamboo-identification.co.uk/index.html	[Produces viable seed? Yes] "at least 1 correctly identified plant was recently still in cultivation in Europe, but started flowering in 2008. Its seed has been widely distributed as D. khasianum 'Shillong'. It is small in stature, to 2m, with leaves to 12cm, and purple rings above and below the nodes."
603	2013. WRA Specialist. Personal Communication.	[Hybridizes naturally? Unknown]
604	2013. WRA Specialist. Personal Communication.	[Self-compatible or apomictic? Unknown]
605	1994. Zomlefer, W.B Guide to Flowering Plant Families. The University of North Carolina Press, Chapel Hill & London	[Requires specialist pollinators? No] Poaceae [anemophilous. Wind-pollinated]
606	1994. Stapleton, C.M.A The bamboos of Nepal and Bhutan Part I: Bambusa, Dendrocalamus, Melocanna, Cephalostachyum, Teinostachyum, and Pseudostachyum (Gramineae: Poaceae, Bambusoideae). Edinburgh Journal of Botany. 51(1): 1-32.	[Reproduction by vegetative fragmentation? Unlikely] "The genera Drepanostachyum, Himalayacalamus, Ampelocalamus, and Neomicrocalamus all have pachymorph rhizomes, rather than the leptomorph rhizomes found in Arundinaria and Chimonobambusa." [This species clumps and is unlikely to spread far by vegetative means]
607	1991. Stapleton, C.M.A A morphological investigation of some Himalayan bamboos with an enumeration of taxa in Nepal and Bhutan. PhD Diss. University of Aberdeen, Aberdeen, UK	[Minimum generative time (years)?] "The flowers of this species are not known." [Suggests this species flowers only after long period of time]

607	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Minimum generative time (years)? 40+] "This species appears to have a flowering cycle of 48-58 years." [Information for D. falcatum. D. kasianum would presumably also flower after a long time interval]
701	2006. Quattrocchi, U CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymolog. CRC Press, Boca Raton, FL	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? No] "flowering gregarious and periodical" [No evidence, and unlikely given long periods before flowering occurs]
702	2013. Backyard Gardener. Drepanostachyum khasianum. http://www.backyardgardener.com/plantname/pda_ac1a.html [Accessed 08 May 2013]	[Propagules dispersed intentionally by people? Yes] Cultivated as an ornamental outside native range
703	2013. WRA Specialist. Personal Communication.	[Propagules likely to disperse as a produce contaminant? No] No evidence, and unlikely given long intervals before plants flower and produce seed
704	2006 (onwards). Clayton, W.D./Vorontsova, M.S./Harman, K.T./Williamson, H GrassBase - The Online World Grass Flora. http://www.kew.org/data/grasses-db.html	[Propagules adapted to wind dispersal? Possibly] "Caryopsis with adherent pericarp; fusiform; 12 mm long; apex unappendaged. Hilum linear. " [When produced, seeds possibly wind or gravity dispersed]
705	1994. Stapleton, C.M.A Bamboos of Nepal. Royal Botanic Gardens Kew / Overseas Development Administration Forestry Research Programme, Oxford, UK	[Propagules water dispersed? No] "This species has been found in several districts of central Nepal. It is the most common forest bamboo species between 1000 m and 2000 m, and it flowered in Charikot and Nagarkot in 1985. It is only found in the forest and is not cultivated. [No evidence that it commonly occurs in riparian areas, and seeds, when produced, lack obvious adaptations for water dispersal]
706	2006 (onwards). Clayton, W.D./Vorontsova, M.S./Harman, K.T./Williamson, H GrassBase - The Online World Grass Flora. http://www.kew.org/data/grasses-db.html	[Propagules bird dispersed? No] "Caryopsis with adherent pericarp; fusiform; 12 mm long; apex unappendaged. Hilum linear." [Not fleshy-fruited, and seeds, when produced, likely to be consumed by seed predators rather than dispersers]
707	2006 (onwards). Clayton, W.D./Vorontsova, M.S./Harman, K.T./Williamson, H GrassBase - The Online World Grass Flora. http://www.kew.org/data/grasses-db.html	[Propagules dispersed by other animals (externally)? No] "Caryopsis with adherent pericarp; fusiform; 12 mm long; apex unappendaged. Hilum linear. " [Unlikely. Seeds, when produced, lack means of extenral attachment]
708	2013. WRA Specialist. Personal Communication.	[Propagules survive passage through the gut? Unknown] Unlikely to be consumed and dispersed internally
801	2006. Quattrocchi, U CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymolog. CRC Press, Boca Raton, FL	[Prolific seed production (>1000/m2)? Unknown] "flowering gregarious and periodical" [May produce high seed densities after infrequent flowering intervals]
802	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Evidence that a persistent propagule bank is formed (>1 yr)? Unknown] "Seed storage orthodox" [Information for Drepanostachyum falcatum. No information on field condtions for D. khasianum was found]
803	2013. WRA Specialist. Personal Communication.	[Well controlled by herbicides? Unknown] No information on herbicide efficacy or chemical control of this species
804	1994. Stapleton, C.M.A Bamboos of Nepal. Royal Botanic Gardens Kew / Overseas Development Administration Forestry Research Programme, Oxford, UK	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] "Where the forest is protected or adequately managed, this bamboo is regularly harvested, but much of its natural habitat has been reduced to degraded scrub, where it cannot reach a large enough size to be of any use." [Regularly harvested and can presumably produce new shoots repeatedly]
805	2013. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? Unknown]

Summary of Risk Traits

High Risk / Undesirable Traits

- Thrives in subtropical climates
- Shade tolerant
- Tolerates many soil types
- May produce viable seeds that can be dispersed by gravity, wind or people
- May resprout after repeated cutting or harvesting of shoots & culms (may be difficult to remove from unwanted areas)

Low Risk / Desirable Traits

- No negative impacts have been documented
- Edible shoots
- Fodder source in native range
- Non-toxic
- Landscaping and ornamental value
- Will only flower after long life-span
- A clumping bamboo that will not spread vegetatively and is not likely to be spread accidentally due to sterility for most of its life cycle