

Family: *Poaceae*

Taxon: *Bambusa oliveriana*

Synonym: NA

Common Name: bush bamboo
wa-pyu-san

Questionnaire : current 20090513
Status: Assessor Approved

Assessor: Assessor
Data Entry Person: HPWRA OrgData

Designation: L
WRA Score -2

101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?	y=1, n=-1	
103	Does the species have weedy races?	y=1, n=-1	
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	n
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	?
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	n
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	n
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	n
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic	y=1, n=0	
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals	y=1, n=-1	
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens	y=1, n=0	
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	n
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	
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	n
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	>3
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	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	y
705	Propagules water dispersed	y=1, n=-1	
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	y
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	n
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	

Designation: L

WRA Score -2

Supporting Data:

101	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	[Is the species highly domesticated? No] No evidence
102	2013. WRA Specialist. Personal Communication.	NA
103	2013. WRA Specialist. Personal Communication.	NA
201	2010. Jha, L.K.. Bamboo based agroforestry systems to reclaim degraded hilly tracts (jhum) land in North Eastern India. Bamboo Science and Culture. 23(1): 1-28.	[Species suited to tropical or subtropical climate(s) 2-High] "Distribution: Native to Myanmar and Mizoram (India), presence recorded only in Aizawl district, a few clumps in Kolasib districts."
202	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	[Quality of climate match data 2-High]
203	1998. Seethalakshmi, K.K./Muktesh Kumar, M.S.. Bamboos of India: A Compendium. INBAR, Beijing, China	[Broad climate suitability (environmental versatility)? No] "This species occurs from 300-600 m altitude in moist deciduous forests along ravines." [Tropical species of moist, lower to middle elevations]
204	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	[Native or naturalized in regions with tropical or subtropical climates? Yes] "DISTRIBUTION Asia-tropical: Indo-China."
205	1997. Bezona, N.C./Rauch, F.D.. Bamboo for Forest and Garden. CTAHR Fact Sheet. Ornamentals and Flowers no. 18. CTAHR, UH Manoa, Honolulu, HI	[Does the species have a history of repeated introductions outside its natural range? Hawaiian Islands]
205	2007. Randall, R.P.. The introduced flora of Australia and its weed status. CRC for Australian Weed Management, Glen Osmond, Australia	[Does the species have a history of repeated introductions outside its natural range? Australia]
205	2009. Santo, L./Yeh, A./Fitch, M./Dudley, N./McCormack, R.. Bamboo Windbreak for Agriculture in Hawaii. ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technical/cig/2009/	[Does the species have a history of repeated introductions outside its natural range? Oahu] "The following bunching bamboo species were selected for comparison at three farms sites on Oahu:" ... "Bambusa oliveriana - 30 to 40 ft with 2-inch canes. It is wind tolerant, has wood of good quality, edible shoots and currently used as windbreak and privacy hedge."
205	2011. Benton, A./Thomson, L./Berg, P./Ruskin, S.. Farm and Forestry Production and Marketing Profile for Bamboo (various species). In Elevitch, C.R. (ed.) Specialty Crops for Pacific Island Agroforestry. Permanent Agriculture Resources (PAR), Holualoa, HI	[Does the species have a history of repeated introductions outside its natural range?] "Table 3. Species currently available from a variety of commercial nurseries in the Pacific" [Includes B. oliveriana]
301	2007. Randall, R.P.. The introduced flora of Australia and its weed status. CRC for Australian Weed Management, Glen Osmond, Australia	[Naturalized beyond native range? No] No evidence in Australia
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

305	2003. Blundell, A.G./Scatena, F.N./Wentzel, R./Sommers, W.. Ecorisk assessment using indicators of sustainability: invasive species in the Caribbean National Forest of Puerto Rico. <i>Journal of forestry</i> . 101(1): 14-19.	[Congeneric weed? Yes] "The ongoing colonization by both Africanized honeybees (<i>Apis mellifera</i>) and bamboo (<i>Bambusa</i> sp., family Poaceae) pose large threats. Introduced bamboo can form monospecific stands in riparian zones..." "... <i>Bambusa vulgaris</i> was introduced to Puerto Rico at least 150 years ago from Southeast Asia (Francis 1993) and planted in the national forest about 70 years ago to control soil erosion along steep dirt roads. It has since colonized many streams that intersect roads and formed monocultures in some riparian areas (O'Connor et al. 2000)." "...Bamboo accounts for both benefits and costs for the Caribbean National Forest: the positive services of erosion control versus competition with native plants. Once established, however, bamboo is extremely difficult to eradicate. Clumps are resilient to physical damage, and the entire rhizome must be removed to prevent resprouting"
305	2008. Global Invasive Species Database. <i>Bambusa vulgaris</i> . http://www.issg.org/database/species/ecology.asp?si=1399&fr=1&sts=&lang=EN	[Congeneric weed? Yes] " <i>Bambusa vulgaris</i> forms extensive monospecific stands where it occurs, excluding other plant species. <i>B. vulgaris</i> colonises along streams into forest...Control of <i>Bambusa vulgaris</i> infestation is difficult. "Best to cut down and spray the regrowth"
401	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	[Produces spines, thorns or burrs? No] "HABIT Perennial; caespitose. Rhizomes short; pachymorph. Culms erect; 1300–1500 cm long; 25–50 mm diam.; woody; without nodal roots. Culm-internodes terete; thin-walled; 35 cm long; distally pruinose, or glabrous. Lateral branches dendroid. Branch complement many. Culm-sheaths 20–25 cm long; 2 times as long as wide; glabrous; convex at apex; auriculate. Culm-sheath blade lanceolate, or triangular; cordate; 10–20 cm long; hispid. Leaves cauline. Leaf-sheaths striately veined; glabrous on surface. Ligule an eciliate membrane; erose. Collar with external ligule. Leaf-blade base with a brief petiole like connection to sheath; petiole 0.2–0.4 cm long. Leaf-blades linear; 10–18 cm long; 10–15 mm wide. Leaf-blade venation indistinct; with 8–10 secondary veins. Leaf-blade surface glabrous. Leaf-blade margins scaberulous. Leaf-blade apex attenuate. "
402	2013. WRA Specialist. Personal Communication.	[Allelopathic? Unknown]
403	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	[Parasitic? No] Poaceae
404	2000. Elevitch, C.R./Wilkinson, K.M.. Agroforestry guides for Pacific Islands. Permanent Agriculture Resources, Holualoa, HI	[Unpalatable to grazing animals? Unknown] A related species, <i>Bambusa multiplex</i> , is listed as a potential fodder crop
404	2011. Benton, A./Thomson, L./Berg, P./Ruskin, S.. Farm and Forestry Production and Marketing Profile for Bamboo (various species). In Elevitch, C.R. (ed.) Specialty Crops for Pacific Island Agroforestry. Permanent Agriculture Resources (PAR), Holualoa, HI	[Unpalatable to grazing animals? Unknown] "Bamboo leaves make excellent fodder for livestock including cows, horses and pigs." [Probably palatable, but no specific information found on <i>Bambusa oliveriana</i>]
405	2008. Wagstaff, D.J.. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	[Toxic to animals? No] No evidence
406	1998. Seethalakshmi, K.K./Muktesh Kumar, M.S.. Bamboos of India: A Compendium. INBAR, Beijing, China	[Host for recognized pests and pathogens?] "The presence of bamboo-pit scale insect <i>Asterolecanium logum</i> is reported."
407	2010. Jha, L.K.. Bamboo based agroforestry systems to reclaim degraded hilly tracts (jhum) land in North Eastern India. <i>Bamboo Science and Culture</i> . 23(1): 1-28.	[Causes allergies or is otherwise toxic to humans? No] "Uses: Thatching of houses, toys, furniture farm implements, mats etc." [Multiple human uses with no evidence of toxicity]
407	2011. Sen Mandi, S. et al.. Amplified fragment length polymorphism based study of phylogenetic relationship & genetic variability among some edible bamboo species of North-East India. <i>Journal of Plant Molecular Biology & Biotechnology</i> . 2(2): 8-15.	[Causes allergies or is otherwise toxic to humans? No] "Table 1 Name (Scientific), site of collection with GPS data and Voucher numbers of edible bamboo species used for AFLP analysis" [<i>Bambusa oliveriana</i> listed as an edible bamboo]
408	1998. Seethalakshmi, K.K./Muktesh Kumar, M.S.. Bamboos of India: A Compendium. INBAR, Beijing, China	[Creates a fire hazard in natural ecosystems? No] This species occurs from 300-600 m altitude in moist deciduous forests along ravines." [No evidence, and unlikely in moist conditions]
408	2010. Jha, L.K.. Bamboo based agroforestry systems to reclaim degraded hilly tracts (jhum) land in North Eastern India. <i>Bamboo Science and Culture</i> . 23(1): 1-28.	[Creates a fire hazard in natural ecosystems? Unlikely] "...poor fire resistance." [Although it may burn under dry conditions, it would be unlikely to increase fire hazards under natural conditions as plants would probably be killed by fire]

409	2010. Jha, L.K.. Bamboo based agroforestry systems to reclaim degraded hilly tracts (jhum) land in North Eastern India. <i>Bamboo Science and Culture</i> . 23(1): 1-28.	[Is a shade tolerant plant at some stage of its life cycle? No] Prefers higher altitude, light demander," [Light demanding species probably shade intolerant]
410	2013. Backyard Gardener. <i>Bambusa oliveriana</i> . http://www.backyardgardener.com/plantname/pda_d72d.html [Accessed 01 May 2013]	[Tolerates a wide range of soil conditions? Unknown] "pH Range: 5.5 to 6.5 Soil Range: Sandy Loam to Clay Loam" [Insufficient information]
411	1998. Seethalakshmi, K.K./Muktesh Kumar, M.S.. <i>Bamboos of India: A Compendium</i> . INBAR, Beijing, China	[Climbing or smothering growth habit? No] "A pretty, moderate sized, tufted bamboo."
412	2002. Iyer, S.. Guidelines for building bamboo-reinforced masonry in earthquake-prone areas in India. MSc Thesis. University of Southern California, Los Angeles, CA	[Forms dense thickets?] "A very pretty moderate sized dense clumping bamboo with thick-walled strong, straight, glossy, green culms." [A densely tufted, clumping bamboo]
412	2013. Bamboo Land. <i>Bambusa oliveriana</i> . http://www.bambooland.com.au/Bamboo/Bambusa-oliveriana [Accessed 01 May 2013]	[Forms dense thickets? No] "Growth habit: Very tight clumping, slightly weeping culms" [A non-running, tightly clumped bamboo. No evidence that it forms thickets]
501	2013. WRA Specialist. Personal Communication.	[Aquatic? No] Terrestrial
502	2006 (onwards). Clayton, W.D./Vorontsova, M.S./Harman, K.T./Williamson, H.. <i>GrassBase - The Online World Grass Flora</i> . http://www.kew.org/data/grasses-db.html	[Grass? Yes] Poaceae
503	2006 (onwards). Clayton, W.D./Vorontsova, M.S./Harman, K.T./Williamson, H.. <i>GrassBase - The Online World Grass Flora</i> . http://www.kew.org/data/grasses-db.html	[Nitrogen fixing woody plant? No] Poaceae
504	2010. Gordon, D.R./Mitterdorfer, B./Pheloung, P.C. et al.. Guidance for addressing the Australian Weed Risk Assessment questions. <i>Plant Protection Quarterly</i> . 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	1998. Seethalakshmi, K.K./Muktesh Kumar, M.S.. <i>Bamboos of India: A Compendium</i> . INBAR, Beijing, China	[Evidence of substantial reproductive failure in native habitat? No] No evidence
601	2006 (onwards). Clayton, W.D./Vorontsova, M.S./Harman, K.T./Williamson, H.. <i>GrassBase - The Online World Grass Flora</i> . http://www.kew.org/data/grasses-db.html	[Evidence of substantial reproductive failure in native habitat? No] No evidence
602	1998. Seethalakshmi, K.K./Muktesh Kumar, M.S.. <i>Bamboos of India: A Compendium</i> . INBAR, Beijing, China	[Produces viable seed? Yes] "Caryopsis 0.75 mm long, ovate, furrowed on one side, slightly hairy at tip." ... "Gregarious flowering was reported from Myanmar in 1893-1894." [Presumably produces viable seeds, albeit probably only after long period of vegetative growth]
603	2013. WRA Specialist. Personal Communication.	[Hybridizes naturally? Unknown] Other <i>Bambusa</i> species have been artificially crossed
604	2001. Koshy, K.C./Jee, G.. Studies on the absence of seed set in <i>Bambusa vulgaris</i> . <i>Current Science</i> . 81 (4): 375-378.	[Self-compatible or apomictic? Unknown] "In spite of germination, the pollen tube did not find its way into the style, to effect fertilization. This appears to be the result of self-incompatibility. Self incompatibility can be confirmed only when pollen grains of a different clone are available for effective cross pollination" [description is for <i>B. vulgaris</i> , a related species. Unknown for <i>B. oliveriana</i>]
605	1994. Zomlefer, W.B.. <i>Guide to Flowering Plant Families</i> . The University of North Carolina Press, Chapel Hill & London	[Requires specialist pollinators? No] Poaceae [anemophilous. Wind-pollinated]
606	2006 (onwards). Clayton, W.D./Vorontsova, M.S./Harman, K.T./Williamson, H.. <i>GrassBase - The Online World Grass Flora</i> . http://www.kew.org/data/grasses-db.html	[Reproduction by vegetative fragmentation? No] "Perennial; caespitose. Rhizomes short; pachymorph" [Bamboos with pachymorph rhizomes usually spread much slower than leptomorph bamboos, and the culms are usually arranged in a tightly spaced clump, which is known as a caespitose habit.]
606	2013. Bamboo Land. <i>Bambusa oliveriana</i> . http://www.bambooland.com.au/Bamboo/Bambusa-oliveriana [Accessed 01 May 2013]	[Reproduction by vegetative fragmentation? No] "Growth habit: Very tight clumping, slightly weeping culms"
606	2013. WRA Specialist. Personal Communication.	[Reproduction by vegetative fragmentation? No] A clumping bamboo - rhizomes will not run sideways.

607	1998. Subramaniam, K.N.. Bamboo Genetic Resources In India. Pp 31-62 in Bamboo and Rattan Genetic Resources in Certain Asian Countries. INBAR, New Delhi, India	[Minimum generative time (years)? Unknown, but certainly more than 4 years] "Flowering: J.W. Oliver collected it in flower during 1893-94 from Myanmar and remarked that the flowering appears to be general." [Exact time to flowering unspecified, but limited observations of flowering suggest long life span before flowering occurs]
701	2013. WRA Specialist. Personal Communication.	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? No] No evidence, and unlikely, as this is a clumping bamboo that flowers infrequently, and after long intervals
702	1997. Bezona, N.C./Rauch, F.D.. Bamboo for Forest and Garden. CTAHR Fact Sheet. Ornamentals and Flowers no. 18. CTAHR, UH Manoa, Honolulu, HI	[Propagules dispersed intentionally by people? Yes] "Description and uses" ... "Graceful ornamental"
703	1998. Seethalakshmi, K.K./Muktesh Kumar, M.S.. Bamboos of India: A Compendium. INBAR, Beijing, China	[Propagules likely to disperse as a produce contaminant? No] "Caryopsis 0.75 mm long, ovate, furrowed on one side, slightly hairy at tip." ... "Gregarious flowering was reported from Myanmar in 1893-1894." [No evidence, and unlikely, as this bamboo produces viable seeds, albeit probably only after long period]
704	1998. Seethalakshmi, K.K./Muktesh Kumar, M.S.. Bamboos of India: A Compendium. INBAR, Beijing, China	[Propagules adapted to wind dispersal? Yes] "Caryopsis 0.75 mm long, ovate, furrowed on one side, slightly hairy at tip." ... "Gregarious flowering was reported from Myanmar in 1893-1894." [When produced, seeds presumably wind or gravity dispersed]
705	2013. WRA Specialist. Personal Communication.	[Propagules water dispersed? Unknown]
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] "FRUIT Caryopsis with adherent pericarp." [Not fleshy-fruited]
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] "FRUIT - Caryopsis with adherent pericarp." [Seeds, when produced, lack means of external attachment]
708	2013. WRA Specialist. Personal Communication.	[Propagules survive passage through the gut? Unknown] Unlikely to be internally dispersed
801	1998. Seethalakshmi, K.K./Muktesh Kumar, M.S.. Bamboos of India: A Compendium. INBAR, Beijing, China	[Prolific seed production (>1000/m ²)? Unknown] "Caryopsis 0.75 mm long, ovate, furrowed on one side, slightly hairy at tip." ... "Gregarious flowering was reported from Myanmar in 1893-1894." [May produce high seed densities after during infrequent flowering intervals]
802	2013. WRA Specialist. Personal Communication.	[Evidence that a persistent propagule bank is formed (>1 yr)? Unknown]
803	1961. Cruzado, H.J./Muzik, T.J./Kennard, W.C.. Control of Bamboo in Puerto Rico by Herbicides. Weeds. 9 (1): 20-26.	[Well controlled by herbicides? Probably Yes] "The combination of TCA and monuron at the rate of 0.8 and 0.4 pounds, respectively, per 50 culms, gave excellent kill in Bambusa multiplex and Dendrocalamus strictus" [Related invasive Bambusa is effectively controlled by herbicides. B. oliveriana would probably be effectively controlled as well]
804	2010. Jha, L.K.. Bamboo based agroforestry systems to reclaim degraded hilly tracts (jhum) land in North Eastern India. Bamboo Science and Culture. 23(1): 1-28.	[Tolerates, or benefits from, mutilation, cultivation, or fire? No] "...poor fire resistance."
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 tropical climates
- Related Bambusa species have become invasive
- 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
- 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