Key Words: Low Risk, Tropical, Ornamental Shrub, Showy Flowers, Limited Seed Set

Family: ***Rubiaceae***

Taxon: ***Cubanola domingensis***

Synonym: *Portlandia domingensis Britton (basionym)* ***Common Name:*** Dominica bell flower
campanita

Questionaire : current 20090513 **Assessor:** Chuck Chimera **Designation:** L
Status: Assessor Approved **Data Entry Person:** Chuck Chimera **WRA Score -4**

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**	**y**
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)**	**n**
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**	
406	**Host for recognized pests and pathogens**	**y=1, n=0**	**n**
407	**Causes allergies or is otherwise toxic to humans**	**y=1, n=0**	
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**	**y**
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**	**n**
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**	
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**	
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**	**2**
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**	
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**	**n**
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**	
805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	**y=-1, n=1**	

Designation: L **WRA Score** **-4**

Supporting Data:

101	1918. Standley, P.C.. Flora of North America. Vol 32. Part 1. Rubiales. Rubiaceae. New York Botanical Garden, NY	[Is the species highly domesticated? No evidence]
101	1987. Clay, H.F./Hubbard, J.C./Golt, R.. The Hawaii Garden: Tropical Shrubs. University of Hawaii Press, Honolulu, HI	[Is the species highly domesticated? No evidence]
102	2012. WRA Specialist. Personal Communication.	NA
103	2012. WRA Specialist. Personal Communication.	NA
201	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Species suited to tropical or subtropical climate(s) - 2-High] "Native: SOUTHERN AMERICA Caribbean: Dominican Republic"
202	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Quality of climate match data 2-High]
203	1987. Clay, H.F./Hubbard, J.C./Golt, R.. The Hawaii Garden: Tropical Shrubs. University of Hawaii Press, Honolulu, HI	[Broad climate suitability (environmental versatility)? No] "The Dominica bell flower is best suited to cool, moist mountain and valley regions where rainfall is plentiful and ground moisture is certain."
203	2012. Dave's Gardern. PlantFiles: Cubanola - Cubanola domingensis [Accessed 04 Sep 2012]. http://davesgarden.com/guides/pf/go/59896/	[Broad climate suitability (environmental versatility)? No] "Hardiness: USDA Zone 11: above 4.5 °C (40 °F)"
204	1914. Britton, N.L.. Studies of West Indian Plants-V. Bulletin of the Torrey Botanical Club. 41(1): 1-24.	[Native or naturalized in regions with tropical or subtropical climates? Yes] "Near San Pedro de Macoris, Santo Domingo"
204	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Native or naturalized in regions with tropical or subtropical climates? Yes] "Native: SOUTHERN AMERICA Caribbean: Dominican Republic"
205	1987. Clay, H.F./Hubbard, J.C./Golt, R.. The Hawaii Garden: Tropical Shrubs. University of Hawaii Press, Honolulu, HI	[Does the species have a history of repeated introductions outside its natural range? Yes] "Although Portlandia domingensis is native to Dominica, a small Caribbean island near Guadeloupe, it is cultivated extensively throughout America for its great beauty"
301	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Naturalized beyond native range? No evidence]
301	2012. Wagner, W.L./Herbst, D.R./Khan, N./Flynn, T.. Hawaiian Vascular Plant Updates: A Supplement to the Manual of the Flowering Plants of Hawai`i & Hawai`i's Ferns & Fern Allies. http://botany.si.edu/pacificislandbiodiversity/hawaianflora/supplement.htm	[Naturalized beyond native range? 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 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 evidence]
304	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Environmental weed? No evidence]
305	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Congeneric weed? No] No species of Portlandia (former genus) or Cubanola reported to be naturalized or invasive
401	1987. Clay, H.F./Hubbard, J.C./Golt, R.. The Hawaii Garden: Tropical Shrubs. University of Hawaii Press, Honolulu, HI	[Produces spines, thorns or burrs? No] "A flat topped, spreading, woody, evergreen shrub that grows to about 12 feet in height; its horizontal branching system forms a crown that hangs to the ground; many stems can be seen amid the foliage. Glossy, leathery, gray green, oval leaves are each about 6 inches long."

402	2012. WRA Specialist. Personal Communication.	[Allelopathic? Unknown]
403	1987. Clay, H.F./Hubbard, J.C./Golt, R.. The Hawaii Garden: Tropical Shrubs. University of Hawaii Press, Honolulu, HI	[Parasitic? No] "A flat topped, spreading, woody, evergreen shrub that grows to about 12 feet in height…" [Rubiaceae]
404	2012. WRA Specialist. Personal Communication.	[Unpalatable to grazing animals? Unknown]
405	2008. Wagstaff, D.J.. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	[Toxic to animals? Unknown] No evidence of toxicity reported in genus
405	2012. Dave's Gardern. PlantFiles: Cubanola - Cubanola domingensis [Accessed 04 Sep 2012]. http://davesgarden.com/guides/pf/go/59896/	[Toxic to animals? Unknown] "Danger: Parts of plant are poisonous if ingested" [No other details on toxicity found for this species or genus]
406	1987. Clay, H.F./Hubbard, J.C./Golt, R.. The Hawaii Garden: Tropical Shrubs. University of Hawaii Press, Honolulu, HI	[Host for recognized pests and pathogens? No] "Insects/Diseases - For scale, apply summer oil or malathion." [General pest of many plants]
407	2012. Dave's Gardern. PlantFiles: Cubanola - Cubanola domingensis [Accessed 04 Sep 2012]. http://davesgarden.com/guides/pf/go/59896/	[Causes allergies or is otherwise toxic to humans? Possibly Yes] "Danger: Parts of plant are poisonous if ingested" [No other details on toxicity found for this species or genus]
408	1987. Clay, H.F./Hubbard, J.C./Golt, R.. The Hawaii Garden: Tropical Shrubs. University of Hawaii Press, Honolulu, HI	[Creates a fire hazard in natural ecosystems? No] "The Dominica bell flower is best suited to cool, moist mountain and valley regions where rainfall is plentiful and ground moisture is certain." [Unlikely given wet forest habitat]
409	1987. Clay, H.F./Hubbard, J.C./Golt, R.. The Hawaii Garden: Tropical Shrubs. University of Hawaii Press, Honolulu, HI	[Is a shade tolerant plant at some stage of its life cycle? Yes, but does not thrive] "grows best in full sun, becomes ragged and rangy in the shade."
409	2012. Dave's Gardern. PlantFiles: Cubanola - Cubanola domingensis [Accessed 04 Sep 2012]. http://davesgarden.com/guides/pf/go/59896/	[Is a shade tolerant plant at some stage of its life cycle? Yes] "Sun Exposure: Sun to Partial Shade Partial to Full Shade"
410	2012. Dave's Gardern. PlantFiles: Cubanola - Cubanola domingensis [Accessed 04 Sep 2012]. http://davesgarden.com/guides/pf/go/59896/	[Tolerates a wide range of soil conditions?] "Soil pH requirements: 6.6 to 7.5 (neutral) 7.6 to 7.8 (mildly alkaline)"
410	2012. Top Tropicals. Portlandia domingensis, Cubanola domingensis [Accessed 04 Sep 2012]. http://toptropicals.com/cgi-bin/garden_catalog/cat.cgi?uid=Cubanola_domingensis	[Tolerates a wide range of soil conditions?] "Given its native habitat, portlandia does well in alkaline soils."
411	1987. Clay, H.F./Hubbard, J.C./Golt, R.. The Hawaii Garden: Tropical Shrubs. University of Hawaii Press, Honolulu, HI	[Climbing or smothering growth habit? No] "A flat topped, spreading, woody, evergreen shrub that grows to about 12 feet in height…"
412	1914. Britton, N.L.. Studies of West Indian Plants-V. Bulletin of the Torrey Botanical Club. 41(1): 1-24.	[Forms dense thickets? No evidence]
412	1918. Standley, P.C.. Flora of North America. Vol 32. Part 1. Rubiales. Rubiaceae. New York Botanical Garden, NY	[Forms dense thickets? No evidence]
501	1987. Clay, H.F./Hubbard, J.C./Golt, R.. The Hawaii Garden: Tropical Shrubs. University of Hawaii Press, Honolulu, HI	[Aquatic? No] Terrestrial shrub
502	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Grass? No] Rubiaceae
503	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Nitrogen fixing woody plant? No] Rubiaceae
504	1987. Clay, H.F./Hubbard, J.C./Golt, R.. The Hawaii Garden: Tropical Shrubs. University of Hawaii Press, Honolulu, HI	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "A flat topped, spreading, woody, evergreen shrub that grows to about 12 feet in height…"
601	2012. WRA Specialist. Personal Communication.	[Evidence of substantial reproductive failure in native habitat? Unknown]

602	1987. Clay, H.F./Hubbard, J.C./Golt, R.. The Hawaii Garden: Tropical Shrubs. University of Hawaii Press, Honolulu, HI	[Produces viable seed? Yes] "Quite difficult to propagate. New plants usually are started from cuttings and from seeds." … "Not known to seed in Hawaii."
602	2009. Jacob Uluwehi's photostream. Cubanola domingensis [Accessed 04 Sep 2012]. http://www.flickr.com/photos/morabeza79/4518808209/	[Produces viable seed? Yes] "I obtained fresh seed and sowed them in May 2008. They took 45 days to germinate. Six months later I transferred them from the shallow community pot in which they were sown into individual plugs. A year on from sowing I distributed the seedlings to friends throughout Hawai'i and to a few plant buffs on the mainland. The most rewarding thing for me was donating 3 plug trays to Lyon Arboretum. I believe they have been featured in the past two Lyon plant sales and I really hope that through my humble efforts this wonderful species will not be so rare in Hawaiian gardens."
603	2012. WRA Specialist. Personal Communication.	[Hybridizes naturally? Unknown]
604	2012. WRA Specialist. Personal Communication.	[Self-compatible or apomictic? Unknown]
605	1918. Standley, P.C.. Flora of North America. Vol 32. Part 1. Rubiales. Rubiaceae. New York Botanical Garden, NY	[Requires specialist pollinators? Possibly Yes] "Flowers large, axillary or terminal, the pedice1s often bracteate; hypanthium usually turbinate; calyx-lobes 4 or 5, short or elongate, persistent; corolla large, subcampanulate to funnelform or tubular-funnelform, the tube 5- angulate, glabrous in the throat, the limb 4- or 5-lobate, the lobes reduplicate-valvate or subimbrieate. Stamens 4 or 5, inserted at the base of the throat or at the base of the corolla-tube, the filaments filiform, pubescent; anthers basifixed, linear, included or short-aserted. Disk lobate." … "flowers axillary, solitary, the pedicels very stout, 5-8 mm. long, subangulate; calyx-lobes linear, 1.5-2.5 cm. long, attenuate"
605	2011. Southern Illinois University. Plant Biology / PLB 479 / Lecture PLB479/ Pollination Syndromes [Accessed 04 Sep 2012]. http://www.plantbiology.siu.edu/PLB479/Lectures%20PLB479/PollinationSyndromes.html	[Requires specialist pollinators? Possibly Yes] "Hawkmoths = Sphingophily Other moths = Phalaenophily" [Genus Cubanola]
605	2011/2012. The University of Oxford. Recent developments at the University of Oxford Botanic Garden and Harcourt Arboretum. Botanic Garden News. 79: 8.	[Requires specialist pollinators? Possibly Yes] "for many years we have been nurturing a plant of Cubanola domingensis from the coffee family, the Rubiaceae. The flowers are extraordinary – tubular and pale yellow, they hang vertically downwards, and are more than eight inches long. We do not know yet what pollinates it but it is an amazing example of the apparent extravagant, almost wasteful, nature of biology."
606	1987. Clay, H.F./Hubbard, J.C./Golt, R.. The Hawaii Garden: Tropical Shrubs. University of Hawaii Press, Honolulu, HI	[Reproduction by vegetative fragmentation? No evidence] "Very slow growth rate; difficult to transplant successfully." [Unlikely to spread vegetatively if transplanting whole plants is difficult]
607	1987. Clay, H.F./Hubbard, J.C./Golt, R.. The Hawaii Garden: Tropical Shrubs. University of Hawaii Press, Honolulu, HI	[Minimum generative time (years)? Presumably >1 year, if not more] "The shrub is extremely slow growing and difficult to transplant successfully. It is an excellent container plant, able to spend a long lifetime in a good-sized pot."
607	2012. Top Tropicals. Portlandia domingensis, Cubanola domingensis [Accessed 04 Sep 2012]. http://toptropicals.com/cgi-bin/garden_catalog/cat.cgi?uid=Cubanola_domingensis	[Minimum generative time (years)? Presumably >1 year, if not more] "Very slow growing. Adds up 4-5" per year. Initially the shrub grows on a tall single stem so it has the look of a standard or lollipop. Gradually, with age, it fills out and becomes more shrub-like."
701	1918. Standley, P.C.. Flora of North America. Vol 32. Part 1. Rubiales. Rubiaceae. New York Botanical Garden, NY	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? No evidence] "Capsule thick-coriaceous, terete, costate, or angulate, loculicidally bivalvate from the apex." [Genus] "capsule oval-elliptic, 4-4.5 cm. long, much constricted at the apex, narrowed at the base, acutely 5-angulate; seeds dark reddish-brown, compressed, 3-4 mm long, puncticulate." [Unlikely, as fruits and seeds lack means of external attachment and are apparently rarely produced in cultivation]
702	1987. Clay, H.F./Hubbard, J.C./Golt, R.. The Hawaii Garden: Tropical Shrubs. University of Hawaii Press, Honolulu, HI	[Propagules dispersed intentionally by people? Yes] "The Dominica bell flower was introduced to Hawaii in 1934 by the U.S. Department of Agriculture. Even after so many years in the Islands, however, the Dominica bell flower is still a rare specimen plant, seldom found in local gardens. When it is seen, often it is mistakenly thought to be angel's trumpet (Datura candida) because of its very similar pendent flowers."
703	1987. Clay, H.F./Hubbard, J.C./Golt, R.. The Hawaii Garden: Tropical Shrubs. University of Hawaii Press, Honolulu, HI	[Propagules likely to disperse as a produce contaminant? No evidence] "Quite difficult to propagate. New plants usually are started from cuttings and from seeds." … "Not known to seed in Hawaii." [Not widely cultivated, and unlikely given limited or lack of seed production]

704	1918. Standley, P.C.. Flora of North America. Vol 32. Part 1. Rubiales. Rubiaceae. New York Botanical Garden, NY	[Propagules adapted to wind dispersal? Unknown] "Capsule thick-coriaceous, terete, costate, or angulate, loculicidally bivalvate from the apex." [Genus] "capsule oval-elliptic, 4-4.5 cm. long, much constricted at the apex, narrowed at the base, acutely 5-angulate; seeds dark reddish-brown, compressed, 3-4 mm long, puncticulate." [No apparent adaptations for wind dispersal]
705	1918. Standley, P.C.. Flora of North America. Vol 32. Part 1. Rubiales. Rubiaceae. New York Botanical Garden, NY	[Propagules water dispersed? Unknown] "Capsule thick-coriaceous, terete, costate, or angulate, loculicidally bivalvate from the apex." [Genus] "capsule oval-elliptic, 4-4.5 cm. long, much constricted at the apex, narrowed at the base, acutely 5-angulate; seeds dark reddish-brown, compressed, 3-4 mm long, puncticulate." [Buoyancy of fruits and seeds unknown]
706	1918. Standley, P.C.. Flora of North America. Vol 32. Part 1. Rubiales. Rubiaceae. New York Botanical Garden, NY	[Propagules bird dispersed? No evidence] "Capsule thick-coriaceous, terete, costate, or angulate, loculicidally bivalvate from the apex." [Genus] "capsule oval-elliptic, 4-4.5 cm. long, much constricted at the apex, narrowed at the base, acutely 5-angulate; seeds dark reddish-brown, compressed, 3-4 mm long, puncticulate."
707	1918. Standley, P.C.. Flora of North America. Vol 32. Part 1. Rubiales. Rubiaceae. New York Botanical Garden, NY	[Propagules dispersed by other animals (externally)? No evidence] "Capsule thick-coriaceous, terete, costate, or angulate, loculicidally bivalvate from the apex." [Genus] "capsule oval-elliptic, 4-4.5 cm. long, much constricted at the apex, narrowed at the base, acutely 5-angulate; seeds dark reddish-brown, compressed, 3-4 mm long, puncticulate." [Capsules and seeds lack means of external attachment]
707	1991. Eriksson, O./Bremer, B.. Fruit Characteristics, Life Forms, and Species Richness in the Plant Family Rubiaceae. The American Naturalist. 138(3): 751-761.	[Propagules dispersed by other animals (externally)? Abiotically dispersed] "Most capsules in the Rubiaceae are considered homologous. Generally they contain a large number of small, abiotically dispersed seeds."
708	2012. WRA Specialist. Personal Communication.	[Propagules survive passage through the gut? Unknown] No apparent adaptations for internal dispersal
801	1987. Clay, H.F./Hubbard, J.C./Golt, R.. The Hawaii Garden: Tropical Shrubs. University of Hawaii Press, Honolulu, HI	[Prolific seed production (>1000/m2)? Not in Hawaiian Islands] "Not known to seed in Hawaii."
802	2012. Dave's Gardern. PlantFiles: Cubanola - Cubanola domingensis [Accessed 04 Sep 2012]. http://davesgarden.com/guides/pf/go/59896/	[Evidence that a persistent propagule bank is formed (>1 yr)? Possibly No] "Allow pods to dry on plant; break open to collect seeds. Seed does not store well; sow as soon as possible"
803	2012. WRA Specialist. Personal Communication.	[Well controlled by herbicides? Unknown] No information on herbicide efficacy or chemical control of this species
804	2012. Top Tropicals. Portlandia domingensis, Cubanola domingensis [Accessed 04 Sep 2012]. http://toptropicals.com/cgi-bin/garden_catalog/cat.cgi?uid=Cubanola_domingensis	[Tolerates, or benefits from, mutilation, cultivation, or fire? Unknown] "It is cold sensitive, and should be planted with protection from winter winds. Cold may cause leaves to drop and severe cold may knock it back to the ground, but it will spring back."
805	2012. 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
- Shade tolerant
- Possibly toxic (unverified)

Low Risk / Desirable Traits

- No reports of naturalization, invasiveness, or negative impacts have been documented
- Unarmed (no spines, thorns, or burrs)
- Landscaping and ornamental value
- Showy flowers
- Limited or no seed production in cultivation
- Slow growth rate