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| Taxon: <i>Wrightia religiosa</i> (Teijsm. & Binn.) Benth. ex Hook. f. | Family: Apocynaceae |
| Common Name(s): water jasmine wild water plum | Synonym(s): <i>Echites religiosus</i> Teijsm. & Binn. |

| | | |
|--------------------------------|----------------------------------|-----------------------------|
| Assessor: Chuck Chimera | Status: Assessor Approved | End Date: 8 Apr 2022 |
| WRA Score: 0.0 | Designation: L | Rating: Low Risk |

Keywords: Small Tree, Bonsai, Unarmed, Wind-Dispersed, Heavy Pruning

| Qsn # | Question | Answer Option | Answer |
|-------|---|--|--------|
| 101 | Is the species highly domesticated? | y=-3, n=0 | n |
| 102 | Has the species become naturalized where grown? | | |
| 103 | Does the species have weedy races? | | |
| 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) | n |
| 401 | Produces spines, thorns or burrs | y=1, n=0 | n |
| 402 | Allelopathic | | |
| 403 | Parasitic | y=1, n=0 | n |
| 404 | Unpalatable to grazing animals | | |
| 405 | Toxic to animals | y=1, n=0 | n |
| 406 | Host for recognized pests and pathogens | | |
| 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 | | |

| Qsn # | Question | Answer Option | Answer |
|-------|--|---|--------|
| 410 | Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island) | | |
| 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 | n |
| 602 | Produces viable seed | y=1, n=-1 | y |
| 603 | Hybridizes naturally | | |
| 604 | Self-compatible or apomictic | | |
| 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 | 2 |
| 701 | Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas) | | |
| 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 | | |
| 706 | Propagules bird dispersed | y=1, n=-1 | n |
| 707 | Propagules dispersed by other animals (externally) | | |
| 708 | Propagules survive passage through the gut | y=1, n=-1 | n |
| 801 | Prolific seed production (>1000/m2) | | |
| 802 | Evidence that a persistent propagule bank is formed (>1 yr) | | |
| 803 | Well controlled by herbicides | | |
| 804 | Tolerates, or benefits from, mutilation, cultivation, or fire | y=1, n=-1 | y |
| 805 | Effective natural enemies present locally (e.g. introduced biocontrol agents) | | |

Supporting Data:

| Qsn # | Question | Answer |
|-------|---|---|
| 101 | Is the species highly domesticated? | n |
| | Source(s) | Notes |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | [No evidence] "Distribution: Thailand, Cambodia, possibly Peninsular Malaysia. The natural distribution of this species is now obscure because it is so widely cultivated, but is probably Thailand and maybe Cambodia. It may also be native in Peninsular Malaysia, but is certainly widely cultivated in many parts of Malesia." |

| | | |
|-----|---|-------|
| 102 | Has the species become naturalized where grown? | |
| | Source(s) | Notes |
| | WRA Specialist. (2022). Personal Communication | NA |

| | | |
|-----|--|-------|
| 103 | Does the species have weedy races? | |
| | Source(s) | Notes |
| | WRA Specialist. (2022). Personal Communication | NA |

| | | |
|-----|---|---|
| 201 | Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical" | High |
| | Source(s) | Notes |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | "Distribution: Thailand, Cambodia, possibly Peninsular Malaysia. The natural distribution of this species is now obscure because it is so widely cultivated, but is probably Thailand and maybe Cambodia. It may also be native in Peninsular Malaysia, but is certainly widely cultivated in many parts of Malesia." |

| | | |
|-----|---|---|
| 202 | Quality of climate match data | High |
| | Source(s) | Notes |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | "Distribution: Thailand, Cambodia, possibly Peninsular Malaysia. The natural distribution of this species is now obscure because it is so widely cultivated, but is probably Thailand and maybe Cambodia. It may also be native in Peninsular Malaysia, but is certainly widely cultivated in many parts of Malesia." |

| | | |
|-----|---|---|
| 203 | Broad climate suitability (environmental versatility) | n |
| | Source(s) | Notes |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | "Distribution: Thailand, Cambodia, possibly Peninsular Malaysia. The natural distribution of this species is now obscure because it is so widely cultivated, but is probably Thailand and maybe Cambodia. It may also be native in Peninsular Malaysia, but is certainly widely cultivated in many parts of Malesia." |

| Qsn # | Question | Answer |
|-------|---|---|
| | Dave's Garden. (2022). <i>Wrightia religiosa</i> . https://davesgarden.com/guides/pf/go/97919/ . [Accessed 8 Apr 2022] | "Hardiness: USDA Zone 10a: to -1.1 °C (30 °F) USDA Zone 10b: to 1.7 °C (35 °F) USDA Zone 11: above 4.5 °C (40 °F)" |
| | Top Tropicals. (2022). <i>Wrightia religiosa</i> , <i>Echites religiosa</i> . https://toptropicals.com/catalog/uid/Wrightia_religiosa.htm . [Accessed 8 Apr 2022] | " <i>Wrightia</i> is cold sensitive and becomes deciduous under 65F, it might look ugly in winter in cooler zones (hardy to zone 9). In warm subtropical and tropical climates it stays evergreen and blooms year round." |

| 204 | Native or naturalized in regions with tropical or subtropical climates | y |
|-----|---|---|
| | Source(s) | Notes |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | "Distribution: Thailand, Cambodia, possibly Peninsular Malaysia. The natural distribution of this species is now obscure because it is so widely cultivated, but is probably Thailand and maybe Cambodia. It may also be native in Peninsular Malaysia, but is certainly widely cultivated in many parts of Malesia." |
| | Ngan, P. T. (1965). A Revision of the Genus <i>Wrightia</i> (Apocynaceae). <i>Annals of the Missouri Botanical Garden</i> , 52(2), 114-175 | "Northern Malaya, Thailand, Cambodia and southern Vietnam; common in evergreen forests but also widely cultivated in gardens and around temples; flowering around the year." |
| | Imada, C. (2019). Hawaiian Naturalized Vascular Plants Checklist (February 2019 update). Bishop Museum Technical Report 69. Bishop Museum, Honolulu, HI | No evidence in the Hawaiian Islands |

| 205 | Does the species have a history of repeated introductions outside its natural range? | ? |
|-----|---|---|
| | Source(s) | Notes |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | [Distinctions between cultivated and natural ranges are obscure] "The natural distribution of this species is now obscure because it is so widely cultivated, but is probably Thailand and maybe Cambodia. It may also be native in Peninsular Malaysia, but is certainly widely cultivated in many parts of Malesia." |

| 301 | Naturalized beyond native range | n |
|-----|---|--|
| | Source(s) | Notes |
| | Chong, K.Y., Tan, H.T.W. & Corlett, R.T. (2009). A Checklist of the Total Vascular Plant Flora of Singapore: Native, Naturalized and Cultivated Species. Raffles Museum of Biodiversity Research, National University of Singapore, Singapore | " <i>Wrightia religiosa</i> (Teijsm. & Binn.) Benth. ex Hook. f.; shrub; exotic; casual; cultivated" [casual = Exotic species that do not form self-replacing populations and rely on repeated introductions or limited asexual reproduction for persistence.] |

| Qsn # | Question | Answer |
|-------|---|---|
| | Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall | [Classified as a casual alien. Status as a weed not supported by the cited references] "Wrightia religiosa (Teijsm. & Binn.) Benth. ex Hook. f. Apocynaceae Total N° of Refs: 4 Habit: Tree Preferred Climate/s: Tropical Origin: E Asia Major Pathway/s: Ornamental Dispersed by: Humans References: Singapore-U-1290, Singapore-U-1839, Malaysia-W-1977, Singapore-W-1977." |
| | Imada, C. (2019). Hawaiian Naturalized Vascular Plants Checklist (February 2019 update). Bishop Museum Technical Report 69. Bishop Museum, Honolulu, HI | No evidence |

| 302 | Garden/amenity/disturbance weed | n |
|-----|---|---|
| | Source(s) | Notes |
| | Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall | [Classified as a casual alien. Status as a weed not supported by the cited references] "References: Singapore-U-1290, Singapore-U-1839, Malaysia-W-1977, Singapore-W-1977." |

| 303 | Agricultural/forestry/horticultural weed | n |
|-----|---|---|
| | Source(s) | Notes |
| | Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall | [Classified as a casual alien. Status as a weed not supported by the cited references] "References: Singapore-U-1290, Singapore-U-1839, Malaysia-W-1977, Singapore-W-1977." |
| | CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc | No evidence |

| 304 | Environmental weed | n |
|-----|---|---|
| | Source(s) | Notes |
| | Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall | [Classified as a casual alien. Status as a weed not supported by the cited references] "References: Singapore-U-1290, Singapore-U-1839, Malaysia-W-1977, Singapore-W-1977." |
| | CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc | No evidence |

| 305 | Congeneric weed | n |
|-----|---|-------------|
| | Source(s) | Notes |
| | Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall | No evidence |
| | CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc | No evidence |

| Qsn # | Question | Answer |
|-------|---|--|
| 401 | Produces spines, thorns or burrs | n |
| | Source(s) | Notes |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | [No evidence] "Shrub or small tree to 5 m tall. Branchlets puberulent, soon becoming glabrous and sparsely lenticellate. Leaves: petiole 1.5-4.0 mm long; blade papery, elliptic or oblong, 1.2-8.2 x 0.6-3.3 cm, 2.2-4.2 times as long as wide, apex acuminate, rarely to rounded, base cuneate, puberulent on midrib beneath and sometimes on midrib above, or completely glabrous, blade punctate beneath and sometimes above, 3-8 pairs of secondary veins, ascending, often obscure, tertiary venation obscure. Inflorescence 1.7-4.2 cm long; glabrous or sparsely puberulent; pedicels 8-30 mm long, very delicate; flowers pendulous. Sepals ovate or oblong, 1.0-2.5 x 0.7-1.0 mm, 1.9-2.4 times as long as wide, apex obtuse to acute, glabrous, ciliate; colleters small and narrow." |

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|-----|--|----------------------------|
| 402 | Allelopathic | |
| | Source(s) | Notes |
| | WRA Specialist. (2022). Personal Communication | Unknown. No evidence found |

| | | |
|-----|---|---|
| 403 | Parasitic | n |
| | Source(s) | Notes |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | "Shrub or small tree to 5 m tall." [Apocynaceae. No evidence] |

| | | |
|-----|--|--|
| 404 | Unpalatable to grazing animals | |
| | Source(s) | Notes |
| | Thapa, B., Walker, D. H., & Sinclair, F. L. (1997). Indigenous knowledge of the feeding value of tree fodder. <i>Animal Feed Science and Technology</i> , 68(1-2), 37-54 | [Unknown. Other species palatable to goats and sheep] "Table 1. Trees, shrubs and bamboos cultivated for fodder on farms and their key characteristics" [<i>Wrightia antidysenterica</i> - Palatable for (of cattle, buffalo, goats and sheep) = Goats and sheep] |

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|-----|---|---|
| 405 | Toxic to animals | n |
| | Source(s) | Notes |
| | Tropical Plants Database, Ken Fern. (2022). <i>Wrightia religiosa</i> . https://tropical.theferns.info/viewtropical.php?id=Wrightia+religiosa . [Accessed 8 Apr 2022] | "Known Hazards None known" |
| | Quattrocchi, U. (2012). <i>CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology</i> . CRC Press, Boca Raton, FL | [No evidence. Related species, <i>Wrightia antidysenterica</i> , with "leaves eaten by goats"] " <i>Wrightia religiosa</i> ... Astringent." |

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|-----|---|--|
| 406 | Host for recognized pests and pathogens | |
|-----|---|--|

| Qsn # | Question | Answer |
|-------|---|--|
| | Source(s) | Notes |
| | Meislik, J. (2007). Water Jasmine - <i>Wrightia religiosa</i> . https://www.bonsaihunk.us/Wrightia.html . [Accessed 8 Apr 2022] | "Insects do not bother <i>Wrightias</i> to any significant extent and insect infestation is cured with the usual treatments. <i>Wrightias</i> are not particularly sensitive or damaged by any of the usual insecticide sprays, but Sevin insecticide causes leaf drop." |
| | Sunshine Seeds. (2022). <i>Wrightia religiosa</i> . http://www.sunshine-seeds.de/Wrightia-religiosa-38372p.html?language=en . [Accessed 8 Apr 2022] | "Pests: Spider mites > especially under glass" |

| 407 | Causes allergies or is otherwise toxic to humans | n |
|-----|---|--|
| | Source(s) | Notes |
| | Tropical Plants Database, Ken Fern. (2022). <i>Wrightia religiosa</i> . https://tropical.theferns.info/viewtropical.php?id=Wrightia+religiosa . [Accessed 8 Apr 2022] | "Known Hazards None known" |
| | Quattrocchi, U. (2012). CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL | [No evidence] " <i>Wrightia religiosa</i> ... Astringent." |
| | Wagstaff, D.J. (2008). International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL | No evidence |

| 408 | Creates a fire hazard in natural ecosystems | n |
|-----|---|---|
| | Source(s) | Notes |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | [No evidence] "Distribution: Thailand, Cambodia, possibly Peninsular Malaysia. The natural distribution of this species is now obscure because it is so widely cultivated, but is probably Thailand and maybe Cambodia. It may also be native in Peninsular Malaysia, but is certainly widely cultivated in many parts of Malesia." |

| 409 | Is a shade tolerant plant at some stage of its life cycle | n |
|-----|---|--|
| | Source(s) | Notes |
| | Sunshine Seeds. (2022). <i>Wrightia religiosa</i> . http://www.sunshine-seeds.de/Wrightia-religiosa-38372p.html?language=en . [Accessed 8 Apr 2022] | "Locations: sun to semi-shade" |
| | Top Tropicals. (2022). <i>Wrightia religiosa</i> , <i>Echites religiosa</i> . https://toptropicals.com/catalog/uid/Wrightia_religiosa.htm . [Accessed 8 Apr 2022] | "Prefers well draining soil, partial to full sun." |

| 410 | Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island) | n |
|-----|--|-----------------------------------|
| | Source(s) | Notes |
| | Flora Fauna Web. (2022). <i>Wrightia religiosa</i> . https://www.nparks.gov.sg/florafaunaweb/flora/2/5/2556 . [Accessed 8 Apr 2022] | "Moist Soils, Well-Drained Soils" |

| Qsn # | Question | Answer |
|------------|---|---|
| | GardenTags. (2022). <i>Wrightia religiosa</i> . Water Jasmine. https://www.gardentags.com/plant-encyclopedia/wrightia-religiosa/20275 . [Accessed 8 Apr 2022] | "Soil: Water Jasmine likes moist and free draining ph: 5.0 - 7.0 Acid - Neutral" |
| 411 | Climbing or smothering growth habit | n |
| | Source(s) | Notes |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | "Shrub or small tree to 5 m tall." |
| 412 | Forms dense thickets | n |
| | Source(s) | Notes |
| | Ngan, P. T. (1965). A Revision of the Genus <i>Wrightia</i> (Apocynaceae). <i>Annals of the Missouri Botanical Garden</i> , 52(2), 114–175 | [No evidence] "Northern Malaya, Thailand, Cambodia and southern Vietnam; common in evergreen forests but also widely cultivated in gardens and around temples; flowering around the year." |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | [No evidence] "Thailand, Cambodia, possibly Peninsular Malaysia. The natural distribution of this species is now obscure because it is so widely cultivated, but is probably Thailand and maybe Cambodia. It may also be native in Peninsular Malaysia, but is certainly widely cultivated in many parts of Malesia." |
| 501 | Aquatic | n |
| | Source(s) | Notes |
| | Ngan, P. T. (1965). A Revision of the Genus <i>Wrightia</i> (Apocynaceae). <i>Annals of the Missouri Botanical Garden</i> , 52(2), 114–175 | [Terrestrial] "Northern Malaya, Thailand, Cambodia and southern Vietnam; common in evergreen forests but also widely cultivated in gardens and around temples; flowering around the year" |
| 502 | Grass | n |
| | Source(s) | Notes |
| | USDA, Agricultural Research Service, National Plant Germplasm System. (2022). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 8 Apr 2022] | "Family: Apocynaceae Subfamily: Apocynoideae Tribe: Wrightieae" |
| 503 | Nitrogen fixing woody plant | n |
| | Source(s) | Notes |
| | USDA, Agricultural Research Service, National Plant Germplasm System. (2022). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 8 Apr 2022] | "Family: Apocynaceae Subfamily: Apocynoideae Tribe: Wrightieae" |

| Qsn # | Question | Answer |
|-------|---|------------------------------------|
| 504 | Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers) | n |
| | Source(s) | Notes |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | "Shrub or small tree to 5 m tall." |

| | | |
|-----|---|---|
| 601 | Evidence of substantial reproductive failure in native habitat | n |
| | Source(s) | Notes |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | "Distribution: Thailand, Cambodia, possibly Peninsular Malaysia. The natural distribution of this species is now obscure because it is so widely cultivated, but is probably Thailand and maybe Cambodia. It may also be native in Peninsular Malaysia, but is certainly widely cultivated in many parts of Malesia." |

| | | |
|-----|---|---|
| 602 | Produces viable seed | y |
| | Source(s) | Notes |
| | Staples, G.W. & Herbst, D.R. (2005). <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI | "fruit has not been observed in Hawaii." [Seed set in Hawaii may be limited or absent] |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | "Fruit of paired follicles; 8.5-17 .5 cm long, 3.3-4.5 mm wide; glabrous; not lenticellate. Seeds linear; 7 .0-8 .6 x 1.1-1.3 mm; coma 3.0-3.5 cm long." |
| | Tropical Plants Database, Ken Fern. (2022). <i>Wrightia religiosa</i> . https://tropical.theferns.info/viewtropical.php?id=Wrightia+religiosa . [Accessed 8 Apr 2022] | "Propagation Seed -" |
| | Sunshine Seeds. (2022). <i>Wrightia religiosa</i> . http://www.sunshine-seeds.de/Wrightia-religiosa-38372p.html?language=en . [Accessed 8 Apr 2022] | "Propagation: Seeds/Cuttings Pre-Treatment: 0 Sowing Time: all year round Sowing Deep: ca. 0,5 cm Sowing Mix: Coir or sowing mix + sand or perlite Germination Temperature: ca. 22-25°C Location: bright + keep constantly moist, not wet Germination Time: ca. 3-6 weeks" |

| Qsn # | Question | Answer |
|-------|--|---|
| 603 | Hybridizes naturally | |
| | Source(s) | Notes |
| | Ngan, P. T. (1965). A Revision of the Genus <i>Wrightia</i> (Apocynaceae). <i>Annals of the Missouri Botanical Garden</i> , 52(2), 114–175 | [Unknown. No evidence, but hybrids suspected in genus] "Finally, <i>W. laevis</i> seems to hybridize with <i>W. viridiflora</i> occurring in Thailand. There are some specimens (Kerr 15568, 17148) which Pichon interpreted as <i>W. viridiflora</i> ; however, I suspect that these are hybrids between the 2 species." ... " <i>Wrightia sikkimensis</i> appears to hybridize with other species growing within the same range. The puberulent leaves, the foliaceous bracts and the unusually large and dentate corona segments observed on specimens collected in India (Biswas 3716, Modde 377K) suggest possible hybridization with <i>W. tomentosa</i> ." |

| 604 | Self-compatible or apomictic | |
|-----|---|--|
| | Source(s) | Notes |
| | Kadereit J., & Bittrich V. (eds). (2018). <i>The Families and Genera of Vascular Plants, Volume XV. Flowering Plants Eudicots Apiales, Gentianales (except Rubiaceae)</i> . Springer, Cham, Switzerland | [Self-compatibility documented in genus] "Similarly, <i>Mandevilla pentlandiana</i> and <i>Wrightia arborea</i> (Apocynoids) were found to be self-compatible, but not autogamous (Torres and Galetto 1999; Barman et al. 2018)." |
| | Lipow, S. R., & Wyatt, R. (1999). Floral morphology and late-acting self-incompatibility in <i>Apocynum cannabinum</i> (Apocynaceae). <i>Plant Systematics and Evolution</i> , 219(1-2): 99-109 | [Unknown. Self-compatible species documented in genus] "Second, the breeding systems of most of the 1500 species in the Apocynaceae Juss. have not been examined. Crossing experiments have shown that <i>Wrightia tinctoria</i> (Reddi et al. 1979), <i>Catharanthus roseus</i> (Albers and van der Maesen 1994), <i>Nerium oleander</i> (Herrera 1991), <i>Mandevilla amabilis</i> (S. Lipow unpubl, data), <i>Carissa carandas</i> (Karale et al. 1990), and five species of <i>Pachypodium</i> (Anderson 1983) are self-compatible." |

| 605 | Requires specialist pollinators | n |
|-----|--|---|
| | Source(s) | Notes |
| | Heinrich Böll Stiftung. (2022). Pollinator-Friendly Yards: How You Can Help Protect Pollinators. https://th.boell.org/index.php/en/2020/04/01/pollinator-friendly-yards . [Accessed 8 Apr 2022] | "Butterflies: Butterflies tend to have more specialized diets than bees, and forage on fewer flowering plant species. Native plant species known to attract butterflies include: false daisy (<i>Eclipta prostrata</i>), Indian heliotrope (<i>Heliotropium indicum</i>), fragrant randia (<i>Oxyceros horridus</i>), asoka-tree (<i>Saraca indica</i>), jasmine orange (<i>Murraya paniculata</i>), water jasmine (<i>Wrightia religiosa</i>), coleus (<i>Plectranthus scutellarioides</i>), plumed cockscomb (<i>Celosia argentea</i>), golden shower (<i>Cassia fistula</i>), and crepe ginger (<i>Cheilocostus speciosus</i>)." |

| Qsn # | Question | Answer |
|-------|---|---|
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | "Inflorescence 1.7-4.2 cm long; glabrous or sparsely puberulent; pedicels 8-30 mm long, very delicate; flowers pendulous. Sepals ovate or oblong, 1.0-2.5 x 0.7-1.0 mm, 1.9-2.4 times as long as wide, apex obtuse to acute, glabrous, ciliate; colleters small and narrow. Corolla white; subrotate; sometimes double in cultivated plants; tube 2.1-4.2 mm long; lobes 4.8-9.8 x 1.9-2.7 mm, 2.1-2.6 times as long as wide, obovate, apex rounded; puberulent- papillose on lobes outside and inside, glabrous on tube outside and inside; corona absent. Stamens inserted at corolla mouth, strongly exerted from tube; filaments 1.5-2.5 mm long; anthers 3.8-4.0 x 0.7--0.8 mm, pubescent within and without. Gynoecium of 2 free carpels united into a common style, ovaries 0.8-1.1 mm high, glabrous, of two separate carpels; style and style head 5.7-8.3 mm long." |
| | Meislik, J. (2007). Water Jasmine - <i>Wrightia religiosa</i> . https://www.bonsaihunk.us/Wrightia.html . [Accessed 8 Apr 2022] | "The flowers are white, pendulous, and fill a room with a very lovely fragrance. Long, green bean-like seed pods follow flowering if insects pollinate the flowers." |
| | Reddi, C. S., Reddi, E. U. B., & Reddi, M. S. (1979). A Novel Mechanism of Pollination in <i>Wrightia tinctoria</i> R. Br. <i>Current Science</i> , 48(16), 746-747 | [Related species pollinated without insects contacting pollen or stigma] "In the course of our studies on pollination ecology, we encountered a situation where biotic agents bring about pollination without contacting either pollen or stigma. This mechanism has not so far been reported and hence, is described as an interesting case" ... "In nature, honeybees, carpenter, bees, wasps, flies, butterflies, etc., visit these flowers." |

| 606 | Reproduction by vegetative fragmentation | n |
|-----|---|---|
| | Source(s) | Notes |
| | Meislik, J. (2007). Water Jasmine - <i>Wrightia religiosa</i> . https://www.bonsaihunk.us/Wrightia.html . [Accessed 8 Apr 2022] | "Propagation is easy since <i>Wrightias</i> sprout readily from seed contained inside a green bean-like pod. It is also easily grown from both branch and root cuttings. Most of the small sized bonsai are derived from root cuttings." [Commonly cultivated as a bonsai tree. No indication that plants spread vegetatively under natural conditions] |

| 607 | Minimum generative time (years) | 2 |
|-----|---|---|
| | Source(s) | Notes |
| | Top Tropicals. (2022). <i>Wrightia religiosa</i> , <i>Echites religiosa</i> . https://toptropicals.com/catalog/uid/Wrightia_religiosa.htm . [Accessed 8 Apr 2022] | "Because of its fast growth rate <i>Wrightia</i> can be trained into a bonsai tree within a short period of time." |
| | Meislik, J. (2007). Water Jasmine - <i>Wrightia religiosa</i> . https://www.bonsaihunk.us/Wrightia.html . [Accessed 8 Apr 2022] | "Seed pods ripen, turn black, and crack open to release the small fuzzy capped seeds. New plants are easily grown from the fresh ripe seed. Flowering starts in two years from seed, and cutting grown material." |

| Qsn # | Question | Answer |
|-------|---|--|
| 701 | Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas) | |
| | Source(s) | Notes |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | "Fruit of paired follicles; 8.5-17 .5 cm long, 3.3-4.5 mm wide; glabrous; not lenticellate. Seeds linear; 7 .0-8 .6 x 1.1-1.3 mm; coma 3.0-3.5 cm long." [Unknown. The coma, or tuft of hairs on the seed, may aid adherence to vehicles, machinery or people] |

| 702 | Propagules dispersed intentionally by people | y |
|-----|---|---|
| | Source(s) | Notes |
| | Staples, G.W. & Herbst, D.R. (2005). <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI | "fruit has not been observed in Hawaii. Both single- and double-flowered forms are cultivated." |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | "The natural distribution of this species is now obscure because it is so widely cultivated, but is probably Thailand and maybe Cambodia. It may also be native in Peninsular Malaysia, but is certainly widely cultivated in many parts of Malesia." |

| 703 | Propagules likely to disperse as a produce contaminant | n |
|-----|---|--|
| | Source(s) | Notes |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | "Fruit of paired follicles; 8.5-17 .5 cm long, 3.3-4.5 mm wide; glabrous; not lenticellate. Seeds linear; 7 .0-8 .6 x 1.1-1.3 mm; coma 3.0-3.5 cm long." [Unlikely, as seeds, if produced, are relatively large and not likely to become a contaminant of produce] |

| 704 | Propagules adapted to wind dispersal | y |
|-----|---|---|
| | Source(s) | Notes |
| | Ngan, P. T. (1965). A Revision of the Genus <i>Wrightia</i> (Apocynaceae). <i>Annals of the Missouri Botanical Garden</i> , 52(2), 114-175 | "Follicles 2, free, slender and terete, 12-17 cm. long, smooth, finely striate and glabrous; seeds linear fusiform, about 0.8 cm. long, the white coma about 3.5 cm. long." |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | "Fruit of paired follicles; 8.5-17 .5 cm long, 3.3-4.5 mm wide; glabrous; not lenticellate. Seeds linear; 7 .0-8 .6 x 1.1-1.3 mm; coma 3.0-3.5 cm long." |
| | Daily Express. (2019). Fragrant flowering shrub for everyone. https://www.dailyexpress.com.my/read/3030/fragrant-flowering-shrub-for-everyone/ . [Accessed 8 Apr 2022] | "Water plum seeds are set in much the same way as desert rose seeds which also appear to arrive in a horn-like fruit pod inside which can be found lots of seeds. When fully mature, the walls of the pod tend to dry up, split open and curve backwards. This releases the seeds which turn airborne and are aided in its dispersal by gusts of wind." |

| 705 | Propagules water dispersed | |
|-----|---|---|
| | Source(s) | Notes |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | "Seeds linear; 7 .0-8 .6 x 1.1-1.3 mm; coma 3.0-3.5 cm long." [Buoyancy of seeds unknown] |

| Qsn # | Question | Answer |
|-------|---|--|
| | Theilade, I., Schmidt, L., Chhang, P., & McDonald, J. A. (2011). Evergreen swamp forest in Cambodia: floristic composition, ecological characteristics, and conservation status. <i>Nordic Journal of Botany</i> , 29(1), 71-80 | "Table 3. Checklist of species at Choam Takong. Scientific name, vernacular name, and habitat where recorded: permanently inundated swamp forest = S, periodically inundated areas = P, and upland = U." [<i>Wrightia religiosa</i> occurs in periodically inundated areas, suggesting seeds might be secondarily dispersed by water] |

| 706 | Propagules bird dispersed | n |
|-----|---|---|
| | Source(s) | Notes |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | "Fruit of paired follicles; 8.5-17 .5 cm long, 3.3-4.5 mm wide; glabrous; not lenticellate. Seeds linear; 7 .0-8 .6 x 1.1-1.3 mm; coma 3.0-3.5 cm long." [Adapted for wind dispersal] |

| 707 | Propagules dispersed by other animals (externally) | n |
|-----|---|--|
| | Source(s) | Notes |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | "Seeds linear; 7 .0-8 .6 x 1.1-1.3 mm; coma 3.0-3.5 cm long." [Adapted for wind dispersal, but the coma, or tuft of hairs on the seed, may aid adherence to fur] |

| 708 | Propagules survive passage through the gut | n |
|-----|---|--|
| | Source(s) | Notes |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | "Fruit of paired follicles; 8.5-17 .5 cm long, 3.3-4.5 mm wide; glabrous; not lenticellate. Seeds linear; 7 .0-8 .6 x 1.1-1.3 mm; coma 3.0-3.5 cm long." [Not adapted for ingestion and internal dispersal by animals] |

| 801 | Prolific seed production (>1000/m2) | n |
|-----|---|--|
| | Source(s) | Notes |
| | Staples, G.W. & Herbst, D.R. (2005). <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI | "fruit has not been observed in Hawaii." [Seed set in Hawaii may be limited or absent] |
| | Middleton, D. J. (2005). A revision of <i>Wrightia</i> (Apocynaceae: Apocynoideae) in Malesia. <i>Harvard Papers in Botany</i> , 10(2), 161-182 | "Fruit of paired follicles; 8.5-17 .5 cm long, 3.3-4.5 mm wide; glabrous; not lenticellate. Seeds linear; 7 .0-8 .6 x 1.1-1.3 mm; coma 3.0-3.5 cm long." [Numbers unknown, but unlikely given minimal or absent fruit production in the Hawaiian Islands] |
| | Daily Express. (2019). Fragrant flowering shrub for everyone. https://www.dailyexpress.com.my/read/3030/fragrant-flowering-shrub-for-everyone/ . [Accessed 8 Apr 2022] | [Numbers unknown] "Water plum seeds are set in much the same way as desert rose seeds which also appear to arrive in a horn-like fruit pod inside which can be found lots of seeds. When fully mature, the walls of the pod tend to dry up, split open and curve backwards. This releases the seeds which turn airborne and are aided in its dispersal by gusts of wind. " |

| Qsn # | Question | Answer |
|-------|---|---|
| 802 | Evidence that a persistent propagule bank is formed (>1 yr) | |
| | Source(s) | Notes |
| | Royal Botanic Gardens Kew. (2022) Seed Information Database (SID). Version 7.1. http://data.kew.org/sid/ . [Accessed 8 Apr 2022] | Unknown. Some <i>Wrightia</i> species have orthodox seeds which may be stored for an unspecified period of time, but no information was found for <i>W. religiosa</i> |

| 803 | Well controlled by herbicides | |
|-----|--|---|
| | Source(s) | Notes |
| | WRA Specialist. (2022). Personal Communication | Unknown. No information on herbicide efficacy or chemical control of this species |

| 804 | Tolerates, or benefits from, mutilation, cultivation, or fire | y |
|-----|---|---|
| | Source(s) | Notes |
| | Wigert's Bonsai. (2014). <i>Wrightia Religiosa</i> , Water Jasmine. https://www.wigertsbonsai.com/wrightia-religiosa-water-jasmine-2/ . [Accessed 8 Apr 2022] | " <i>Wrightia</i> will bud back well so heavy pruning in an initial styling is acceptable." |

| 805 | Effective natural enemies present locally (e.g. introduced biocontrol agents) | |
|-----|---|--|
| | Source(s) | Notes |
| | Staples, G.W. & Herbst, D.R. (2005). <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI | [Unknown] "Both single- and double-flowered forms are cultivated." |

Summary of Risk Traits:

High Risk / Undesirable Traits

- Thrives and could spread in regions with tropical climates
- Tolerates many soil types
- Reproduces by seed
- Fast growth rate, and capable of flowering after 2 years from seed
- Seeds dispersed by wind, and through intentional cultivation
- Tolerates heavy pruning

Low Risk Traits

- No reports of naturalization or invasives, but widely cultivated in native range, with natural distribution now obscure
- Unarmed (no spines, thorns, or burrs)
- Non-toxic
- Grows in full sun to part-shade (dense shade may inhibit ability to establish or spread)
- Rarely, if ever, fruits in Hawaiian Islands. May reduce, or eliminate, risk of long-distance dispersal