Taxon: Veronica plebeia R. Br. **Family:** Plantaginaceae

Common Name(s): common speedwell
creeping speedwell
trailing speedwell

Synonym(s):

Assessor: Chuck Chimera **Status:** Assessor Approved **End Date:** 12 Apr 2018

WRA Score: 14.0 **Designation:** H(HPWRA) **Rating:** High Risk

Keywords: Annual Herb, Disturbance Weed, Pasture Weed, Shade-Tolerant, Roots at Nodes

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	y
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	n
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	y
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		
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	y=1, n=0	y

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	y
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	1
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
702	Propagules dispersed intentionally by people		
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	y
704	Propagules adapted to wind dispersal	y=1, n=-1	n
705	Propagules water dispersed	y=1, n=-1	y
706	Propagules bird dispersed		
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut		
801	Prolific seed production (>1000/m2)		
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides	y=-1, n=1	n
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**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[No evidence of domestication] "Native to Australia; in Hawai'i naturalized in dry to wet areas such as pastures or disturbed areas in mesic forest, 860-2,520 m, on Maui and Hawai'i."

102	**Has the species become naturalized where grown?**	
	Source(s)	**Notes**
	WRA Specialist. 2018. Personal Communication	NA

103	**Does the species have weedy races?**	
	Source(s)	**Notes**
	WRA Specialist. 2018. 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**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Native to Australia; in Hawai'i naturalized in dry to wet areas such as pastures or disturbed areas in mesic forest, 860-2,520 m, on Maui and Hawai'i."
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 11 Apr 2018]	"Native Australasia AUSTRALIA: Australia [New South Wales, Queensland, South Australia, Tasmania, Victoria]"

202	**Quality of climate match data**	**High**
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 11 Apr 2018]	

Qsn #	Question	Answer
203	**Broad climate suitability (environmental versatility)**	**y**
	Source(s)	**Notes**
	Daehler, C. C. (2005). Upper-montane plant invasions in the Hawaiian Islands: patterns and opportunities. Perspectives in Plant Ecology, Evolution and Systematics, 7 (3): 203-216	[Elevation range exceeds 1000 m, demonstrating environmental versatility] "Appendix Naturalized plants occurring above 2000m elevation in the Hawaiian Islands." [Veronica plebeian - Low elev (m) = 860; High elev (m) = 2520]
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Elevation range exceeds 1000 m, demonstrating environmental versatility] "Native to Australia; in Hawai'i naturalized in dry to wet areas such as pastures or disturbed areas in mesic forest, 860-2,520 m, on Maui and Hawai'i."

204	**Native or naturalized in regions with tropical or subtropical climates**	**y**
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Native to Australia; in Hawai'i naturalized in dry to wet areas such as pastures or disturbed areas in mesic forest, 860-2,520 m, on Maui and Hawai'i."
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 11 Apr 2018]	"Native Australasia AUSTRALIA: Australia [New South Wales, Queensland, South Australia, Tasmania, Victoria]"

205	**Does the species have a history of repeated introductions outside its natural range?**	**n**
	Source(s)	**Notes**
	WRA Specialist. 2018. Personal Communication	Present, & naturalized, in the Hawaiian Islands & Costa Rica, but no evidence of intentional & repeated introduction outside native range

301	**Naturalized beyond native range**	**y**
	Source(s)	**Notes**
	Vincent, K. (1989). Several Overlooked Introduced Scrophulariaceae in Tropical America. Brittonia, 41(4), 385 -387	"Modern descriptions and line drawings of this Australian species may be found in Barker (1986) and Degener (1956). Although Barker (1986) states that V. plebia is rare in South Australia, Bailey (1906) reported it as a weed of pastureland further north in Queensland. Degener (1956) similarly found it to be a common pasture weed on Maui and Hawaii, and concluded that it must have been introduced there in the late 1800's in impure grass seed. That is a probable mode of introduction to Costa Rica where it is apparently well established in pastures, along roadsides, and in areas cleared of forest, mainly in the Cordillera de Talamanca. The specimens seen document the long presence and persistence of the species there and it may be expected in similar montane habitats in neighboring countries."
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Native to Australia; in Hawai'i naturalized in dry to wet areas such as pastures or disturbed areas in mesic forest, 860-2,520 m, on Maui and Hawai'i. First collected on Hawai'i in 1909 (Rock 3710, BISH).-"

Qsn #	Question	Answer
	Tropicos.org. 2018. Missouri Botanical Garden. http://www.tropicos.org/. [Accessed 11 Apr 2018]	Veronica plebeian collected in Costa Rica, from latitudes of 09°06'45"N to 10°22'00"N & elevations ranging from 1400 m to 2800 m

302	Garden/amenity/disturbance weed	y
	Source(s)	**Notes**
	Bailey, F. M. (1906). The Weeds and Suspected Poisonous Plants of Queensland. H. Pole & Company, Brisbane	"A weed of the pasture lands."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	[Cited as a weed] "Veronica plebeia R.Br. Plantaginaceae Total N° of Refs: 11 Habit: Herb Preferred Climate/s: Mediterranean Major Pathway/s: Ornamental Dispersed by: Humans References: New Zealand-N-280, Australia-N-134, United States of America- N-101, Australia-N-7, United States of America-N-301, United States of America- N-839, Australia-W-869, New Zealand-N- 919, United States of America-N-1292, Australia-N-1902, Australia-W-1977."
	PlantNET. 2018. New South Wales Flora Online - Veronica plebeia. National Herbarium of NSW, Royal Botanic Garden, Sydney. http://plantnet.rbgsyd.nsw.gov.au. [Accessed 11 Apr 2018]	[Weed in lawns and gardens] "Distribution and occurrence: Grows in eucalypt forest, grassland, on rainforest margins and as a weed in lawns and gardens; widespread in coastal districts, west to Warrego River. NSW subdivisions: NC, CC, SC, NT, CT, ST, NWS, CWS, NWP Other Australian states: Qld Vic. W.A. S.A. "

303	Agricultural/forestry/horticultural weed	n
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[No significant negative impacts have been reported to date] "Native to Australia; in Hawai'i naturalized in dry to wet areas such as pastures or disturbed areas in mesic forest, 860-2,520 m, on Maui and Hawai'i."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

304	Environmental weed	n
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[No significant negative impacts have been reported to date] "Native to Australia; in Hawai'i naturalized in dry to wet areas such as pastures or disturbed areas in mesic forest, 860-2,520 m, on Maui and Hawai'i."

305	Congeneric weed	y
	Source(s)	**Notes**

Qsn #	Question	Answer
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Veronica agrestis ... Weed of: Cereals, Orchards & Plantations, Pastures, Potatoes"; "Veronica anagallis ... Weed of: Cereals"; "Veronica anagallis-aquatica ... Weed of: Cereals, Orchards & Plantations, Pastures"; "Veronica anagalloides ... Weed of: Cereals"; "Veronica arvensis ... Weed of: Canola, Cereals, Nursery Production, Orchards & Plantations, Pastures, Vegetables"; "Veronica austriaca ... Weed of: Pastures"; "Veronica beccabunga ... Weed of: Cereals, Pastures"; "Veronica bellidioides ... Weed of: Pastures"; "Veronica biloba ... Weed of: Cereals, Orchards & Plantations, Pastures, Pome Fruits"; "Veronica campylopoda ... Weed of: Cereals, Orchards & Plantations"; "Veronica catenata ... Weed of: Pastures"; "Veronica chamaedrys ... Weed of: Carrots, Cereals, Orchards & Plantations, Pastures, Vegetables"; "Veronica crassifolia ... Weed of: Pastures"; "Veronica cymbalaria ... Weed of: Cereals"; "Veronica didyma ... Weed of: Cereals, Orchards & Plantations, Pome Fruits"; "Veronica dillenii ... Weed of: Cereals"; "Veronica filiformis ... Weed of: Pastures"; "Veronica hederifolia ... Weed of: Bulbs, Canola, Cereals, Cutflowers, Nursery Production, Orchards & Plantations, Vegetables"; "Veronica jacquinii ... Weed of: Pastures"; "Veronica javanica ... Weed of: Cereals"; "Veronica longifolia ... Weed of: Cereals"; "Veronica officinalis ... Weed of: Cereals, Vegetables"; "Veronica opaca ... Weed of: Cereals"; "Veronica pectinata L. var. pectinate ... Weed of: Cereals"; "Veronica peduncularis ... Weed of: Orchards & Plantations"; "Veronica peregrina ... Weed of: Nursery Production, Pastures, Vegetables"; "Veronica peregrina L. subsp. xalapensis ... Weed of: Grapevines, Orchards & Plantations, Pome Fruit"; "Veronica persica ... Weed of: Canola, Carrots, Cereals, Grapevines, Orchards & Plantations, Pastures, Vegetables"; "Veronica polita ... Weed of: Canola, Cereals, Orchards & Plantations, Pastures, Vegetables"; "Veronica praecox ... Weed of: Cereals"; "Veronica prostrata ... Weed of: Pastures"; "Veronica ramosissima ... Weed of: Cereals"; "Veronica reuterana ... Weed of: Cereals"; "Veronica scutellata ... Weed of: Cereals"; "Veronica serpyllifolia ... Weed of: Cereals, Pastures, Vegetables"; "Veronica spicata ... Weed of: Cereals, Pastures"; "Veronica teucrium ... Weed of: Pastures"; "Veronica triphyllos ... Weed of: Cereals, Pastures"; "Veronica verna ... Weed of: Cereals, Pastures";

401	Produces spines, thorns or burrs	n
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[No evidence] "Annual(?) herbs; stems procumbent and sometimes rooting at the nodes, (1-)2-5 dm long, puberulent, rarely sparsely so, usually also sparsely hirsute at the nodes. Leaves somewhat flaccid, broadly ovate to ovate-deltate, 8-25(-50) mm long, 6-23 mm wide, upper surface sparsely puberulent, lower surface sparsely puberulent at least on the veins, sometimes also sparsely hirsute on the nerves, base of blade, or petioles, margins irregularly coarsely toothed, the teeth acute, petioles 3-15 mm long."

402	Allelopathic	

Qsn #	Question	Answer
	Source(s)	**Notes**
	Wang, Y. et al. (2013). Allelopathic effects of water extractions from two Veronica species on 6 kinds of receiving crops. Journal of Northwest A & F University-Natural Science Edition, 41(4), 178-190	[Unknown. Allelopathy documented in genus] "Abstract : Objective: This study explored the allelopathic effects and mechanisms of water extractions from different parts of Veronica persica and V. arvensis on different receiving crops: Vigna unguiculata, Ipomoea aquatica, Zea mays, Phaseolus vulgaris, Cucurbita moschata and Capsicum annuum. It improved the understanding of invasion mechanism and effective prevention of V. persica and V. arvensis. Method: The Petri-dishes cultivation method was used to study the effects of water extractions from whole plant, roots, stems and leaves of V. persica and V. arvensis with a concentration of 0.05 g/mL on seed germination rate, seedling root, and seedling leaf of the 6 receiving crops. Result: V. persica and V. arvensis remarkably inhibited the six receptors, significantly decreasing their seed germination rates, root lengths, root dry masses, leaf lengths and leaf dry masses. In general, compared with the water extractions from other parts of V. persica and V. arvensis, the extractions from leaves of V. persica and the whole plant of V. arvensis had the largest inhibitory. The water extraction from leaves of V. persica decreased the seed germination rates of 6 species by 54.6%, 71.9%, 5.0%, 56.1%, 36.7%, and 24.6%, decreased their root lengths by 0.28, 1.58, 4.39, 2.58, 0.96, and 0.70 cm, decreased their root dry masses by 0.04, 0.09, 0.29, 0.09, 0.12, and 0.10 mg, decreased their leaf lengths by 0.08, 0.13, 0.85, 1.35, 1.54, and 0.41 cm, and decreased their leaf dry masses by 0.04, 0.05, 0.22, 0.45, 0.55, and 0.24 mg, respectivley. Accordingly, the water extraction from whole plant of V. arvensis decreased their seed germination rates by 53.3%, 43.9%, 36.6%, 26.7%, 44.0%, and 30.0%, their root lengths by 1.10, 1.88, 2.13, 2.19, 0.71, and 1.12 cm, their root dry masses by 0.12, 0.19, 0.12, 0.13, 0.14, and 0.14 mg, their leaf lengths by 0.40, 0.73, 0.87, 1.02, 1.21, and 0.52 cm, and their leaf dry masses by 0.11, 0.12, 0.30, 0.38, 0.44, and 0.28 mg, respectively. The synthetic effect RIs of V. persica water extraction or the 6 receiving plants were -0.229, -0.268, -0.203, -0.417, -0.461, and -0.514, respectively. The synthetic effect RIs of V. arvensis water extraction were -0.250, -0.371, -0.215, -0.402, -0.454, and -0.633, respectively. Conclusion: The total inhibitory effects of V. arvensis on the 6 receptors are much stronger than that of V. persica. The sensibilities of the 6 receptors to the two donors are in a decreasing order of C. annuum > C. moschata > P. vulgaris > I. aquatica > V. unguiculata > Z. mays. "

403	Parasitic	n
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Annual(?) herbs; stems procumbent and sometimes rooting at the nodes, (1-)2-5 dm long, puberulent, rarely sparsely so, usually also sparsely hirsute at the nodes." [No evidence]

Qsn #	Question	Answer
404	**Unpalatable to grazing animals**	
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Occurs in pastures & disturbed sites. May benefit from grazing, but palatability unknown] "Native to Australia; in Hawai'i naturalized in dry to wet areas such as pastures or disturbed areas in mesic forest"

405	Toxic to animals	n
	Source(s)	**Notes**
	Bailey, F. M. (1906). The Weeds and Suspected Poisonous Plants of Queensland. H. Pole & Company, Brisbane	"A weed of the pasture lands." [No reports of toxicity]
	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

406	Host for recognized pests and pathogens	
	Source(s)	**Notes**
	McKenzie, E. H. C. (1998). Rust fungi of New Zealand—an introduction, and list of recorded species. New Zealand Journal of Botany, 36(2): 233-271	"Table 2 Native rusts recorded on exotic hosts in New Zealand" [Rust = Aecidium disciforme; Exotic host = Veronica plebeia]
	WRA Specialist. 2018. Personal Communication	Unknown

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	**Notes**
	Bailey, F. M. (1906). The Weeds and Suspected Poisonous Plants of Queensland. H. Pole & Company, Brisbane	"A weed of the pasture lands." [No reports of toxicity]
	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

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[May contribute to fuel load in dry habitats, but unlikely to contribute significantly to fire risk] "Native to Australia; in Hawai'i naturalized in dry to wet areas such as pastures or disturbed areas in mesic forest, 860-2,520 m, on Maui and Hawai'i."

Qsn #	Question	Answer
	Department of Primary Industries. (2014). Veronica plebeia. Threatened Flora of Tasmania. Threatened Species and Marine Section, Department of Primary Industries, Parks, Water and Environment, Hobart. http://dpipwe.tas.gov.au. [Accessed]	[No evidence. A herb of damp sites] "On mainland Australia Veronica plebeia occurs in South Australia, Victoria, New South Wales and Queensland (Walsh & Entwisle 1999). In Tasmania the species' stronghold is the Tamar Valley in the State's central north; there are also scattered records from the east coast, though these lack supporting collections and their identity remains in question. Habitat is typically dry to damp sclerophyll forest dominated by Eucalyptus amygdalina on dolerite (or Tertiary sediments), but also includes Eucalyptus ovata grassy woodland/forest and Melaleuca ericifolia swamp forest."

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	**Notes**
	Knox Environment Society. 2018. Groundcovers, Climbers, Creepers. http://www.kes.org.au/nursery/groundcovers-climbers-creepers. [Accessed 12 Apr 2018]	"Veronica plebeia ... Moist well drained soils; full sun to full shade. Spreads readily in ideal conditions, and makes an attractive groundcover in shaded gardens. "

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	
	Source(s)	**Notes**
	Greg's Indigenous Plants & Landscapes. 2018. Ground Covers. https://www.gregsindigenouslandscapes.com.au/Category6.php. [Accessed 12 Apr 2018]	"Veronica plebeia ... Soil - Clay or loamy"

411	Climbing or smothering growth habit	n
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Annual(?) herbs; stems procumbent and sometimes rooting at the nodes, (1-)2-5 dm long, puberulent, rarely sparsely so, usually also sparsely hirsute at the nodes."

412	Forms dense thickets	n
	Source(s)	**Notes**
	Department of Primary Industries. (2014). Veronica plebeia. Threatened Flora of Tasmania. Threatened Species and Marine Section, Department of Primary Industries, Parks, Water and Environment, Hobart. http://dpipwe.tas.gov.au. [Accessed 12 Apr 2018]	"The species typically occurs in low numbers at a given location, with its scrambling stoloniferous character making quantitative estimates difficult."
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[No evidence] "Annual(?) herbs; stems procumbent and sometimes rooting at the nodes" ... "naturalized in dry to wet areas such as pastures or disturbed areas in mesic forest"

501	Aquatic	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Terrestrial] "Annual(?) herbs ... in Hawai'i naturalized in dry to wet areas such as pastures or disturbed areas in mesic forest, 860-2,520 m, on Maui and Hawai'i."

502	Grass	n
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 11 Apr 2018]	"Family: Plantaginaceae Tribe: Veroniceae"

503	Nitrogen fixing woody plant	n
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 11 Apr 2018]	"Family: Plantaginaceae Tribe: Veroniceae"

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Annual(?) herbs; stems procumbent and sometimes rooting at the nodes, (1-)2-5 dm long, puberulent, rarely sparsely so, usually also sparsely hirsute at the nodes. Leaves somewhat flaccid, broadly ovate to ovate-deltate, 8-25(-50) mm long, 6-23 mm wide, upper surface sparsely puberulent, lower surface sparsely puberulent at least on the veins, sometimes also sparsely hirsute on the nerves, base of blade, or petioles, margins irregularly coarsely toothed, the teeth acute, petioles 3-15 mm long."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	**Notes**
	PlantNET. 2018. New South Wales Flora Online - Veronica plebeia. National Herbarium of NSW, Royal Botanic Garden, Sydney. http://plantnet.rbgsyd.nsw.gov.au. [Accessed 11 Apr 2018]	[No evidence] "Distribution and occurrence: Grows in eucalypt forest, grassland, on rainforest margins and as a weed in lawns and gardens; widespread in coastal districts, west to Warrego River. NSW subdivisions: NC, CC, SC, NT, CT, ST, NWS, CWS, NWP Other Australian states: Qld Vic. W.A. S.A. "

602	Produces viable seed	y
	Source(s)	**Notes**

Qsn #	Question	Answer
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Capsules broadly obovoid to subglobose, compressed, 3-3.6 mm long, 3-3.8 mm wide, margins sparsely puberulent, apex scarcely notched. Seeds ca. 16 per cell, narrowly obovate, angular, ca. 1 mm long."
	New Zealand Plant Conservation Network. (2018). Flora Details - Veronica plebeia. http://www.nzpcn.org.nz/flora_details.aspx?ID=2349. [Accessed 11 Apr 2018]	"Propagation Technique - Easy from fresh seed, stem cuttings and layered pieces. An attractive ground cover. Can be used as an alternative to grass in a lawn. Prefers a well drained soil in full sun but will also grow in semi shaded and soils prone to winter water logging"

603	Hybridizes naturally	
	Source(s)	**Notes**
	Albach, D. C., & Briggs, B. G. (2012). Phylogenetic analysis of Australian species of Veronica (V. section Labiatoides; Plantaginaceae). Australian Systematic Botany, 25(5), 353-363	[Unknown. Hybridization may be possible in genus] "Incongruence between results from nuclear- and plastid-DNA markers suggest hybridisation to be an important factor in the evolution of the group. Our sample of V. parnkalliana included alleles similar to V. decorosa and V. novae-hollandiae at both loci, which suggests a hybrid origin."

604	Self-compatible or apomictic	
	Source(s)	**Notes**
	Theobrominated. 2013. The Great Veronica Hunt —Part 6. http://theobrominated.blogspot.com/2013/12/the-great-veronica-hunt-part-6.html. [Accessed 12 Apr 2018]	"The flowers were closed just as they often are in New Zealand, needing a warm sunny day to open. If they don't get to open, I assume they self-pollinate, because they always seem to set fruits."
	Davidson, G. R., De Lange, P. J., & Garnock-Jones, P. J. (2009). Two additional indigenous species of Veronica (Plantaginaceae) from northern New Zealand: V. jovellanoides, a new and highly endangered species, and V. plebeia R. Br. New Zealand Journal of Botany, 47(3), 271-279	[Possibly. Self-compatibility reported in genus] "The presence of fruit on solitary plants suggests V. jovellanoides is self-compatible, like other New Zealand species of Veronica (Garnock-Jones in Bayly & Kellow 2006)."

Qsn #	Question	Answer
605	**Requires specialist pollinators**	**n**
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Flowers usually 6-14 in open, axillary racemes, pedicels 5-15 mm long, bracteoles elliptic to oblanceolate, ca. 3-4 mm long; calyx lobes foliaceous, obovate, 3-4 mm long, enlarging up to 6 mm long in fruit, margins puberulent and sometimes also short-hirsute, apex mucronulate; corolla blue, ca. 3.5 mm long."
	Department of Primary Industries. (2014). Veronica plebeia. Threatened Flora of Tasmania. Threatened Species and Marine Section, Department of Primary Industries, Parks, Water and Environment, Hobart. http://dpipwe.tas.gov.au. [Accessed 12 Apr 2018]	"Insects are the most likely pollination vector for this species (A. Hingston pers. comm.)."
	Theobrominated. 2013. The Great Veronica Hunt—Part 6. http://theobrominated.blogspot.com/2013/12/the-great-veronica-hunt-part-6.html. [Accessed]	[Apparently not pollinator limited] "The flowers were closed just as they often are in New Zealand, needing a warm sunny day to open. If they don't get to open, I assume they self-pollinate, because they always seem to set fruits."

606	**Reproduction by vegetative fragmentation**	**y**
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Annual(?) herbs; stems procumbent and sometimes rooting at the nodes, (1-)2-5 dm long, puberulent, rarely sparsely so, usually also sparsely hirsute at the nodes."

607	**Minimum generative time (years)**	**1**
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Annual(?) herbs; stems procumbent and sometimes rooting at the nodes, (1-)2-5 dm long, puberulent, rarely sparsely so, usually also sparsely hirsute at the nodes."

701	**Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)**	
	Source(s)	**Notes**
	Vincent, K. (1989). Several Overlooked Introduced Scrophulariaceae in Tropical America. Brittonia, 41(4), 385-387	[Potentially. Occurs along roadsides] "Degener (1956) similarly found it to be a common pasture weed on Maui and Hawaii, and concluded that it must have been introduced there in the late 1800's in impure grass seed. That is a probable mode of introduction to Costa Rica where it is apparently well established in pastures, along roadsides, and in areas cleared of forest, mainly in the Cordillera de Talamanca."
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Seeds small, but lack means of external attachment] "Capsules broadly obovoid to subglobose, compressed, 3-3.6 mm long, 3-3.8 mm wide, margins sparsely puberulent, apex scarcely notched. Seeds ca. 16 per cell, narrowly obovate, angular, ca. 1 mm long."

702	**Propagules dispersed intentionally by people**	

Qsn #	Question	Answer
	Source(s)	**Notes**
	Greg's Indigenous Plants & Landscapes. 2018. Ground Covers. https://www.gregsindigenouslandscapes.com.au/Category6.php. [Accessed]	[Sold online in Australia] "Veronica plebeia ... Price $4.00 ... This is an attractive groundcover that has dense weed suppressing foliage and is ideal for dry shadier areas."
	WRA Specialist. 2018. Personal Communication	No evidence of intentional cultivation in Hawaiian Islands

703	Propagules likely to disperse as a produce contaminant	y
	Source(s)	**Notes**
	Vincent, K. (1989). Several Overlooked Introduced Scrophulariaceae in Tropical America. Brittonia, 41(4), 385-387	"Degener (1956) similarly found it to be a common pasture weed on Maui and Hawaii, and concluded that it must have been introduced there in the late 1800's in impure grass seed. That is a probable mode of introduction to Costa Rica where it is apparently well established in pastures, along roadsides, and in areas cleared of forest, mainly in the Cordillera de Talamanca."

704	Propagules adapted to wind dispersal	n
	Source(s)	**Notes**
	McIntyre, S., Lavorel, S., & Tremont, R. M. 1995. Plant life-history attributes: their relationship to disturbance response in herbaceous vegetation. Journal of Ecology,83 (1): 31-44	"Appendix 1 ... Dispersal unit: U, undefined ... Veronica plebeia"
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[No evidence. Low-growing & no adaptations for wind dispersal] "Annual(?) herbs; stems procumbent and sometimes rooting at the nodes ... Capsules broadly obovoid to subglobose, compressed, 3-3.6 mm long, 3-3.8 mm wide, margins sparsely puberulent, apex scarcely notched. Seeds ca. 16 per cell, narrowly obovate, angular, ca. 1 mm long."

705	Propagules water dispersed	y
	Source(s)	**Notes**
	O'Donnell, J., Fryirs, K., & Leishman, M. R. (2015). Can the regeneration of vegetation from riparian seed banks support biogeomorphic succession and the geomorphic recovery of degraded river channels?. River Research and Applications, 31(7), 834-846	[Seeds found in floodplains, suggesting movement by water] "Table I. List of species for which 20 or more seeds were detected in the seed bank, presented in order of number of seeds detected in the seedling emergence study (seed count) and growth form" [Veronica plebeian - Sites present in seed bank - Bench & Floodplain]

706	Propagules bird dispersed	
	Source(s)	**Notes**
	Van Riper, C. (1976). Aspects of House Finch breeding biology in Hawaii. The Condor, 78(2), 224-229	[Possibly dispersed by nest-building birds] "Veronica plebeia R. Br. Common speedwell. Stems with included fruits and leaves. Occasional; in nests 7 and 8."

707	Propagules dispersed by other animals (externally)	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	McIntyre, S., Lavorel, S., & Tremont, R. M. 1995. Plant life-history attributes: their relationship to disturbance response in herbaceous vegetation. Journal of Ecology,83 (1): 31-44	"Appendix 1 ... Dispersal unit: U, undefined ... Veronica plebeia"
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Seeds small, but lack means of external attachment] "Capsules broadly obovoid to subglobose, compressed, 3-3.6 mm long, 3-3.8 mm wide, margins sparsely puberulent, apex scarcely notched. Seeds ca. 16 per cell, narrowly obovate, angular, ca. 1 mm long."

708	**Propagules survive passage through the gut**	
	Source(s)	**Notes**
	McIntyre, S., Lavorel, S., & Tremont, R. M. 1995. Plant life-history attributes: their relationship to disturbance response in herbaceous vegetation. Journal of Ecology,83 (1): 31-44	[Unknown if consumed, or able to survive gut passage] "Appendix 1 ... Dispersal unit: U, undefined ... Veronica plebeia"

801	**Prolific seed production (>1000/m2)**	
	Source(s)	**Notes**
	Lunt, I. D. (1997). Germinable soil seed banks of anthropogenic native grasslands and grassy forest remnants in temperate south-eastern Australia. Plant Ecology, 130(1), 21-34	"Appendix 1. Soil seed bank composition of grassland and grassy forest remnants." [Veronica plebeia seeds present at densities of 227 per m2]

802	**Evidence that a persistent propagule bank is formed (>1 yr)**	
	Source(s)	**Notes**
	Lunt, I. D. (1997). Germinable soil seed banks of anthropogenic native grasslands and grassy forest remnants in temperate south-eastern Australia. Plant Ecology, 130(1), 21-34	"Table 3. Twenty most abundant species in forest and grassland seedbanks, in order of decreasing abundance. Asterisks denote exotic species." [Veronica plebeia present in seedbank. Longevity unspecified]
	Royal Botanic Gardens Kew. (2018) Seed Information Database (SID). Version 7.1. Available from: http://data.kew.org/sid/. [Accessed 12 Apr 2018]	Unknown, but several species have orthodox seeds

803	**Well controlled by herbicides**	**n**
	Source(s)	**Notes**
	Santos, G.L., Kageler, D., Gardner, D.E., Cuddihy, L.W. & Stone, C.P. 1992. Herbicidal Control of Selected Alien Plant Species in Hawai`i Volcanoes National Park. Pp. 341-375 in Stone, C.P. et al. (eds.) Alien Plant Invasions in Native Ecosystems of Hawai`i. University of Hawaii CPSU, Honolulu, HI	[4 commonly used herbicides had no adverse effects on Veronica plebeia] "Table 10. Responses of nontarget native and introduced plants to herbicide treatments to control blackberry (Rubus argutus)." [Veronica plebeia - + = exposed to treatment, no adverse effects. 2% Garlon 4; 2% Roundup; 2% Amitrol T; 2% Tordon 22K]

804	**Tolerates, or benefits from, mutilation, cultivation, or fire**	**y**

Qsn #	Question	Answer
	Source(s)	**Notes**
	Kubiak, P. J. 2009. Fire responses of bushland plants after the January 1994 wildfires in northern Sydney. Cunninghamia, 11(1): 131-165	Veronica plebeian - R = majority of adult plants resprouted after the fires

805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai‘i Press and Bishop Museum Press, Honolulu, HI.	[Unknown] "Native to Australia; in Hawai'i naturalized in dry to wet areas such as pastures or disturbed areas in mesic forest, 860-2,520 m, on Maui and Hawai'i. First collected on Hawai'i in 1909 (Rock 3710, BISH)"

Summary of Risk Traits:

High Risk / Undesirable Traits
• Elevation range exceeds 1000 m, demonstrating environmental versatility
• Thrives in tropical climates
• Naturalized on Maui & Hawaii (Hawaiian Islands)
• Lawn, pasture & disturbance weed
• Many Veronica species are invasive weeds
• Shade tolerant
• Reproduces by seeds & vegetatively by rooting at nods
• Reaches maturity in 1+ years
• Seeds dispersed as a contaminant, by water & intentionally by people
• Able to resprout after fire

Low Risk Traits
• Unarmed (no spines, thorns, or burrs)
• Non-toxic
• Not reported to cause significant problems to agriculture or natural areas