

Taxon: *Cynoglossum amabile* Stapf & J. R. Drumm.

Family: Boraginaceae

Common Name(s): Chinese hound's-tongue
Chinese-forget-me-not

Synonym(s): *Cynoglossum amabile* f. *leucanthum*
Cynoglossum amabile f. *ruberum*

Assessor: Chuck Chimera

Status: Assessor Approved

End Date: 17 Aug 2021

WRA Score: 12.0

Designation: H(HPWRA)

Rating: High Risk

Keywords: Biennial Herb, Weedy, Mild Toxicity, Barbed Seeds, Externally Dispersed

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	y
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		
304	Environmental weed		
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	y
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)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets		
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	1
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	y
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant		
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	y
708	Propagules survive passage through the gut	y=1, n=-1	n
801	Prolific seed production (>1000/m ²)		
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides	y=-1, n=1	y
804	Tolerates, or benefits from, mutilation, cultivation, or fire		
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.	"Native to eastern Asia; in Hawai'i naturalized and locally common in grassland and pastures, 900-1,850 m, on Hawai'i. First collected in 1931" [No evidence of domestication from native or introduced ranges]

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2021). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2021). 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
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 20 Jul 2021]	"Native Asia-Temperate CHINA: China [Gansu Sheng (s.), Guizhou Sheng (w.), Sichuan Sheng (w.), Yunnan Sheng, Xizang Zizhiqu (s.e. & s.w.)] Asia-Tropical INDIAN SUBCONTINENT: Bhutan"

202	Quality of climate match data	High
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 20 Jul 2021]	

Qsn #	Question	Answer
203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	Wu, Z. Y. & P. H. Raven, eds. (1995). Flora of China. Vol. 16 (Gentianaceae through Boraginaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Hillside meadows, forests, thickets, roadsides, river banks; 2600–3700 m." [Elevation range >1000 m]
	CABI. (2021). <i>Cynoglossum amabile</i> (Chinese forget-me-not). In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	[Grows in temperate and tropical climates] " <i>Cynoglossum amabile</i> is a perennial herb in warmer climates but also grows as an annual in cooler climates. It is native to China and Bhutan but has also been widely planted as an ornamental plant around the world in temperate and tropical climates and is often naturalized where it is planted."

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	Starr, F. & Starr, K. (2011). New plant records from midway Atoll, Maui and Kaho'olawe. Bishop Museum Occasional Papers. 110: 23-35	" <i>Cynoglossum amabile</i> stapf & J.r. Drumm. New island record <i>Cynoglossum amabile</i> (chinese forget-me-not) is previously recorded from Hawai'i island where it is locally common in grasslands and pastures (Wagner et al. 1999). on Maui, it appears to be a new ornamental that readily reseeds itself and spreads beyond where it is planted. this collection represents a new island record for Maui. Material examined: MAUI: east Maui, 'Ulupalakua ranch, planted in herb garden in front of store, spreading locally, 1900 ft [579 m], 25 Mar 2006, Starr & Starr 060325-01."

Qsn #	Question	Answer
	<p>USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 20 Jul 2021]</p>	<p>"Native Asia-Temperate CHINA: China [Gansu Sheng (s.), Guizhou Sheng (w.), Sichuan Sheng (w.), Yunnan Sheng, Xizang Zizhiqu (s.e. & s.w.)] Asia-Tropical INDIAN SUBCONTINENT: Bhutan Cultivated (also cult.) Naturalized Africa EAST TROPICAL AFRICA: Kenya, Tanzania SOUTHERN AFRICA: South Africa [KwaZulu-Natal] Australasia NEW ZEALAND: New Zealand Northern America NORTHEASTERN U.S.A.: United States [Massachusetts, New Hampshire, New York] NORTH-CENTRAL U.S.A.: United States [Oklahoma, Wisconsin] SOUTHEASTERN U.S.A.: United States [Arkansas] REGION: Mexico Pacific NORTH-CENTRAL PACIFIC: United States [Hawaii] Southern America CARIBBEAN: Hispaniola, Jamaica, United States [Puerto Rico] CENTRAL AMERICA: Guatemala, Panama NORTHERN SOUTH AMERICA: Venezuela BRAZIL: Brazil [Santa Catarina] WESTERN SOUTH AMERICA: Bolivia, Colombia, Ecuador, Peru SOUTHERN SOUTH AMERICA: Argentina"</p>

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	CABI. (2021). <i>Cynoglossum amabile</i> (Chinese forget-me-not). In: <i>Invasive Species Compendium</i> . Wallingford, UK: CAB International. www.cabi.org/isc	" <i>Cynoglossum amabile</i> is a perennial herb in warmer climates but also grows as an annual in cooler climates. It is native to China and Bhutan but has also been widely planted as an ornamental plant around the world in temperate and tropical climates and is often naturalized where it is planted."
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). <i>Manual of the flowering plants of Hawaii</i> . Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Native to eastern Asia; in Hawai'i naturalized and locally common in grassland and pastures, 900-1,850 m, on Hawai'i. First collected in 1931 (Morley 23- H, BISH)"

301	Naturalized beyond native range	y
	Source(s)	Notes

Qsn #	Question	Answer
	Oppenheimer, H. (2010). New Hawaiian plant records from Maui County for 2008. Bishop Museum Occasional Papers 107: 33-40	"Boraginaceae <i>Cynoglossum amabile</i> Stapf. & J.R. Drumm. New island record In Hawai'i, this biennial herb is naturalized and locally common in grassland and pastures on Hawai'i (Wagner et al. 1999: 394) and is now known from Maui as well. Material examined. MAUI: East Maui, Makawao Distr, 'Ulupalakua, 585 m, 28 Jan 2007, Oppenheimer H10717."
	Starr, F. & Starr, K. (2011). New plant records from midway Atoll, Maui and Kaho'olawe. Bishop Museum Occasional Papers. 110: 23-35	" <i>Cynoglossum amabile</i> staph & J.r. Drumm. New island record <i>Cynoglossum amabile</i> (chinese forget-me-not) is previously recorded from Hawai'i island where it is locally common in grasslands and pastures (Wagner et al. 1999). on Maui, it appears to be a new ornamental that readily reseeds itself and spreads beyond where it is planted. this collection represents a new island record for Maui. Material examined: MAUI: east Maui, 'Ulupalakua ranch, planted in herb garden in front of store, spreading locally, 1900 ft [579 m], 25 mar 2006, Starr & Starr 060325-01."
	Verdcourt, B. (1991). Flora of Tropical East Africa - Boraginaceae. A.A. Balkema, Rotterdam, Netherlands	"Margins of cultivations, forest clearings. grassland on hillsides, etc.; clearly an escape from gardens but now naturalised; 1350- 1900 m." [Kenya and Tanzania]
	Webb, C. J., Sykes, W. R., & Garnock-Jones, P. J. (1988). Flora of New Zealand Volume IV. Botany Division, DSIR, Christchurch, New Zealand	"N.: a cultivation escape in warmer areas, especially N. Auckland (Kerikeri, and north of Kaukapakapa and Helensville), Bay of Plenty (near Kawerau); S.: around Christchurch; K.: Raoul, naturalised along 1 km of rough road for many years. Waste places, roadsides."
	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 eastern Asia; in Hawai'i naturalized and locally common in grassland and pastures, 900-1,850 m, on Hawai'i. First collected in 1931 (Morley 23- H, BISH)"
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 20 Jul 2021]	"Naturalized Africa EAST TROPICAL AFRICA: Kenya, Tanzania SOUTHERN AFRICA: South Africa [KwaZulu-Natal] Australasia NEW ZEALAND: New Zealand Northern America NORTHEASTERN U.S.A.: United States [Massachusetts, New Hampshire, New York] NORTH-CENTRAL U.S.A.: United States [Oklahoma, Wisconsin] SOUTHEASTERN U.S.A.: United States [Arkansas] REGION: Mexico Pacific NORTH-CENTRAL PACIFIC: United States [Hawaii] Southern America CARIBBEAN: Hispaniola, Jamaica, United States [Puerto Rico] CENTRAL AMERICA: Guatemala, Panama NORTHERN SOUTH AMERICA: Venezuela BRAZIL: Brazil [Santa Catarina] WESTERN SOUTH AMERICA: Bolivia, Colombia, Ecuador, Peru SOUTHERN SOUTH AMERICA: Argentina"

302	Garden/amenity/disturbance weed	y
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Qsn #	Question	Answer
	Source(s)	Notes
	Murphy, M. (2021). Plant Pono Specialist. BIISC Early Detection Technician. personal communication. 9 July	"Kawehi and Carolyn Wong found a huge thicket at Wall Ranch, Kealakekua. They were covered with seeds! Kawehi said they were like velcro."
	CABI. (2021). <i>Cynoglossum amabile</i> (Chinese forget-me-not). In: <i>Invasive Species Compendium</i> . Wallingford, UK: CAB International. www.cabi.org/isc	[A disturbance-adapted, weedy plant. Impacts unspecified] "Cynoglossum amabile is a perennial herb in warmer climates but also grows as an annual in cooler climates. It is native to China and Bhutan but has also been widely planted as an ornamental plant around the world in temperate and tropical climates and is often naturalized where it is planted. It has not been recorded as an invasive species, however, it is considered a weed according to some sources and reportedly spreads as an escape from gardens, via the seed and nursery trade and via internet sales. Information about its impacts where it is naturalized is lacking."
	Dave's Garden. (2021). Chinese Forget-Me-Not - <i>Cynoglossum amabile</i> . https://davesgarden.com/guides/pf/go/258/ . [Accessed 13 Aug 2021]	[Anecdotally reported as a weed of yards and gardens] "n Aug 10, 2021, 1merrie1 from Blacklick, OH wrote: Please don't plant an invasive plant like Chinese forget me not, that is known to crowd out our own pollinator friendly plants." ... "On Aug 13, 2020, jtent303 from Denver, CO wrote: Grows like crazy and has pretty blue flowers but the burrs it produces stick to socks, gloves, shoelaces and are next to impossible to pick off with out ruining what it's stuck to. Pulled it all out!" ... On Mar 15, 2017, ladk from Minneapolis, MN wrote: General Mills has been shipping these out in a free wildflower mix, all over North America. Is anyone else concerned about this? " ... "On Jan 20, 2017, vireo1 from Jersey City, NJ wrote: Folks, it pains me to hear about people still planting a non-native that others have already said is invasive. To promote this as good for the bees.. well, that just doesn't make sense, when there are so many native wildflowers that are just as desirable, if not better. In the long term, invasives can outcompete natives and then change ecosystems dramatically, as we've seen with Japanese knotweed and Japanese honeysuckle, just to name a couple that have invaded ecosystems and are wreaking havoc in the US. Obviously, the fact that one has to cut them out of animal hair and fur to extricate the 'sticky' seeds of this flower, means that the seeds are hitching a ride to wherever that animal goes (and that means, likely being dropped or scratched off in the woods). There's no way to know what the next kudzu or loosestrife will be, but we shouldn't be helping to create it by planting non-natives that we already know take over the garden. Please, go native!" ... "On Mar 22, 2013, artsymom from Winston-Salem, NC (Zone 7b) wrote: I would not plant this one again. It came in a wildflower mix (I believe from American Meadows), and while pretty, it has become very invasive in my part shade location, squeezing out everything else. When it goes to seed it turns into a mess because the seeds are sticky and easily stick to anything that passes by, including my pets, kids, etc., and the seeds are very hard to remove from clothing and fur!"
	WRA Specialist. (2021). Personal Communication	An ornamental plant that has naturalized and invaded pastures, potentially impacting grazing quality. Here designated as a disturbance-adapted weed of yards and gardens, with the potential to impact cattle ranching and pasture productivity/

Qsn #	Question	Answer
303	Agricultural/forestry/horticultural weed	
	Source(s)	Notes
	CABI. (2021). <i>Cynoglossum amabile</i> (Chinese forget-me-not). In: <i>Invasive Species Compendium</i> . Wallingford, UK: CAB International. www.cabi.org/isc	[Impacts unclear] " <i>Cynoglossum amabile</i> is a perennial herb in warmer climates but also grows as an annual in cooler climates. It is native to China and Bhutan but has also been widely planted as an ornamental plant around the world in temperate and tropical climates and is often naturalized where it is planted. It has not been recorded as an invasive species, however, it is considered a weed according to some sources and reportedly spreads as an escape from gardens, via the seed and nursery trade and via internet sales. Information about its impacts where it is naturalized is lacking."
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). <i>Manual of the flowering plants of Hawaii</i> . Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Potential pasture weed] "Native to eastern Asia; in Hawai'i naturalized and locally common in grassland and pastures, 900-1,850 m, on Hawai'i."
	Murphy, M. (2021). Plant Pono Specialist. BIISC Early Detection Technician. personal communication. 9 July	[Reported to form thicket in pastures affected by twolined spittle bug. Unclear if plants will exclude other vegetation, or are merely exploiting openings in former pasture] "Kawehi and Carolyn Wong found a huge thicket at Wall Ranch, Kealakekua. They were covered with seeds! Kawehi said they were like velcro."

304	Environmental weed	
	Source(s)	Notes
	CABI. (2021). <i>Cynoglossum amabile</i> (Chinese forget-me-not). In: <i>Invasive Species Compendium</i> . Wallingford, UK: CAB International. www.cabi.org/isc	[Impacts unclear] " <i>Cynoglossum amabile</i> is a perennial herb in warmer climates but also grows as an annual in cooler climates. It is native to China and Bhutan but has also been widely planted as an ornamental plant around the world in temperate and tropical climates and is often naturalized where it is planted. It has not been recorded as an invasive species, however, it is considered a weed according to some sources and reportedly spreads as an escape from gardens, via the seed and nursery trade and via internet sales. Information about its impacts where it is naturalized is lacking."

305	Congeneric weed	y
	Source(s)	Notes
	CABI. (2021). <i>Cynoglossum officinale</i> (hound's tongue). In: <i>Invasive Species Compendium</i> . Wallingford, UK: CAB International. www.cabi.org/isc	" <i>C. officinale</i> , native to Eurasia, is a highly invasive weed now present throughout much of North America, probably introduced as a seed contaminant. It is a common weed of rangeland and spreads locally attached to the fur of livestock. Its presence reduces the availability of forage grasses and it is poisonous to livestock if ingested. It is possible that further introductions may occur to other countries with similar climates."

401	Produces spines, thorns or burrs	n
	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.	[Barbed prickles aid in dispersal, but otherwise do not cause physical harm to humans or passing animals] "Biennial herbs 2-10 dm tall. Basal leaves lanceolate to oblong-oblongeolate, 6-17 cm long, 1-3 cm wide, gray canescent with fine, soft, usually appressed hairs, petioles 2-9 cm long. Pedicels 2-4 mm long, curved downward after flowering; calyx lobes broadly elliptic to suborbicular, 2-2.5 mm long, densely strigose; corolla blue, white, or pink, ca. 6-7 mm long, the lobes 2-3 mm long. Nutlets ovoid, compressed, 2.5-3 mm long, densely covered with barbed prickles."

402	Allelopathic	
	Source(s)	Notes
	Furness, N., Adomas, B., Dai, Q., Li, S., & Upadhyaya, M. (2008). Allelopathic Influence of Houndstongue (<i>Cynoglossum officinale</i>) and Its Modification By UV-B Radiation. <i>Weed Technology</i> , 22(1), 101-107	[Possibly. Plants grown with increasing degrees of ultraviolet-B radiation increased their allelopathic influence on some forage grasses] "Influence of aqueous leaf extracts, leaf residue, and leached-leaf residue of houndstongue, a noxious rangeland weed, on seedling emergence of forage grasses was studied. Ultraviolet-B (UV-B) effects during houndstongue growth on subsequent germination and growth-inhibitory activity of leaf extracts were investigated. Addition of glasshouse-grown houndstongue leaf extract to mineral soil decreased emergence of crested wheatgrass by 13% and prairie junegrass by 20% at 14 d after sowing. Idaho fescue emergence was unaffected. Incorporation of houndstongue leaf- and leached-leaf residue into soil (0.4 g residue : 20 g soil) delayed emergence of forage grasses. At 14 d after sowing, houndstongue leaf residue spread on the soil surface (0.2 g residue : 20 g soil) tended to inhibit seedling emergence more than leaf residues incorporated into soil. In separate experiments, houndstongue plants were grown at 0, 4, 7, and 11 kJ/m ² /d biologically effective UV-B radiation for 6 wk, and leaf extracts (0.5, 1, 2, and 4% wt/v) were prepared. Exposure of houndstongue to increasing UV-B dose during plant growth generally increased the inhibitory activity of their leaf extract on prairie junegrass germination. Crested wheatgrass and Idaho fescue seedlings incubated in extracts of houndstongue leaves exposed to UV-B, compared with leaves grown in a UV-B-free environment, had decreased root lengths. Leaf extracts of plants exposed to elevated UV-B levels had higher absorbance at 300 nm, indicating greater concentration of UV-B-absorbing compounds. This study suggests houndstongue leaf extracts and residues inhibit seed germination and seedling emergence and that UV-B may enhance their allelopathic influence on some forage grasses. Field studies are needed to confirm the allelopathic influence of houndstongue under rangeland conditions."
	Sangeetha, C., & Baskar, P. (2015). Allelopathy in weed management: A critical review. <i>African Journal of Agricultural Research</i> , 10(9), 1004-1015	[Possibly] "Furness et al. (2008) found that Houndstongue (<i>Cynoglossum officinale</i> L.) plants grown with increasing degrees of ultraviolet-B radiation increased their allelopathic influence on some forage grasses."

403	Parasitic	n
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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.	"Biennial herbs 2-10 dm tall." [Not parasitic]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	NC State Extension. (2021). <i>Cynoglossum amabile</i> . https://plants.ces.ncsu.edu/plants/cynoglossum-amabile/ . [Accessed 16 Aug 2021]	[Toxic to horses, but palatability may be low] "Poison Symptoms: Horses: liver disease (must be ingested in large amount or over a long time period)"
	Jull, L.G. (2001). Plants not favored by deer. A3727. University of Wisconsin Extension, Madison, WI	List includes <i>Cynoglossum amabile</i> suggesting it may be unpalatable

405	Toxic to animals	y
	Source(s)	Notes
	NC State Extension. (2021). <i>Cynoglossum amabile</i> . https://plants.ces.ncsu.edu/plants/cynoglossum-amabile/ . [Accessed 16 Aug 2021]	"Poison Severity: Low Poison Symptoms: Horses: liver disease (must be ingested in large amount or over a long time period) Poison Toxic Principle: Pyrrolizidine alkaloids Causes Contact Dermatitis: No"
	Burrows, G. E., & Tyrl, R. J. (2013). Toxic Plants of North America. Second Edition. Wiley-Blackwell, Hoboken, NJ	[Possibly, but lower hazard than other members of genus] "Species of <i>Cynoglossum</i> contain a mixture of open diesters and monoesters of heliotridine and supinidine. <i>Cynoglossum amabile</i> contains amabiline (supinidine) and echinatine (heliotridine), which are both monoesters and therefore of quite low hazard. <i>Cynoglossum officinale</i> contains the more toxic open -diester heliosupine (heliotridine), acetylheliosupine, and several monoesters, including echinatine; it is of considerably greater hazard than are other species of the genus."
	ASPCA. (2021). Toxic and Non-Toxic Plants - Hound's Tongue. https://www.aspc.org/pet-care/animal-poison-control/toxic-and-non-toxic-plants/hounds-tongue . [Accessed 16 Aug 2021]	[Toxic to horses if ingested in large amounts of a long period of time] "Scientific Name: <i>Cynoglossum amabile</i> Family: Boraginaceae Toxicity: Toxic to Horses Toxic Principles: Pyrrolizidine alkaloids Clinical Signs: Horses: liver disease (must be ingested in large amount or over a long time period)"

Qsn #	Question	Answer
406	Host for recognized pests and pathogens	
	Source(s)	Notes
	Plant Care Today. (2021). Learn Chinese Forget Me Not Care and Growing Tips. https://plantcaretoday.com/chinese-forget-me-not.html . [Accessed 16 Aug 2021]	"Chinese Forget-me-nots are unlikely to be affected by any major pest attack. They don't attract butterflies or hummingbirds. However, powdery mildew may be a problem. This fungus attacks a wide range of plants and leaves appearing as a dusty, white coating on stems, leaves, and flowers."
	Missouri Botanical Garden. (2021). <i>Cynoglossum amabile</i> . http://www.missouribotanicalgarden.org . [Accessed 16 Aug 2021]	"Problems - No serious insect or disease problems."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	NC State Extension. (2021). <i>Cynoglossum amabile</i> . https://plants.ces.ncsu.edu/plants/cynoglossum-amabile/ . [Accessed 16 Aug 2021]	"Poison Severity: Low Poison Symptoms: Horses: liver disease (must be ingested in large amount or over a long time period) Poison Toxic Principle: Pyrrolizidine alkaloids Causes Contact Dermatitis: No"
	Quattrocchi, U. (2012). CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[Used medicinally] "Used to treat cough, scrofula and to stop bleeding of wounds."

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	CABI. (2021). <i>Cynoglossum amabile</i> (Chinese forget-me-not). In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	[No evidence of increase fire risk reported] " <i>Cynoglossum amabile</i> is a perennial herb in warmer climates but also grows as an annual in cooler climates. It is native to China and Bhutan but has also been widely planted as an ornamental plant around the world in temperate and tropical climates and is often naturalized where it is planted. It has not been recorded as an invasive species, however, it is considered a weed according to some sources and reportedly spreads as an escape from gardens, via the seed and nursery trade and via internet sales. Information about its impacts where it is naturalized is lacking."

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	Notes
	Dave's Garden. (2021). Chinese Forget-Me-Not - <i>Cynoglossum amabile</i> . https://davesgarden.com/guides/pf/go/258/ . [Accessed 16 Aug 2021]	"Sun Exposure: Sun to Partial Shade"
	Plant Care Today. (2021). Learn Chinese Forget Me Not Care and Growing Tips. https://plantcaretoday.com/chinese-forget-me-not.html . [Accessed 16 Aug 2021]	"The plant grows in moderately fertile soil and does well in both full sun and partial shade."

Qsn #	Question	Answer
	Missouri Botanical Garden. (2021). <i>Cynoglossum amabile</i> . http://www.missouribotanicalgarden.org . [Accessed 16 Aug 2021]	[Light shade] "Sun: Full sun" ... "It is easily grown in average, medium moisture, well-drained soils in full sun. Plants prefer some light afternoon shade in hot summer climates."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Plant Care Today. (2021). Learn Chinese Forget Me Not Care and Growing Tips. https://plantcaretoday.com/chinese-forget-me-not.html . [Accessed 16 Aug 2021]	" <i>Cynoglossum Amabile</i> does not have specific soil type requirements as long as it's well-drained."
	Missouri Botanical Garden. (2021). <i>Cynoglossum amabile</i> . http://www.missouribotanicalgarden.org . [Accessed 16 Aug 2021]	"It is easily grown in average, medium moisture, well-drained soils in full sun. Plants prefer some light afternoon shade in hot summer climates. Tolerates average to poor soils. Avoid unamended heavy clay soils."
	NC State Extension. (2021). <i>Cynoglossum amabile</i> . https://plants.ces.ncsu.edu/plants/cynoglossum-amabile/ . [Accessed 16 Aug 2021]	"prefers well-drained soil high in organic matter"

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.	"Biennial herbs 2-10 dm tall. Basal leaves lanceolate to oblong-oblongate, 6-17 cm long, 1-3 cm wide, gray canescent with fine, soft, usually appressed hairs, petioles 2-9 cm long."

412	Forms dense thickets	
	Source(s)	Notes
	CABI. (2021). <i>Cynoglossum amabile</i> (Chinese forget-me-not). In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	[Reported to be growing densely on dry hillsides] " <i>C. amabile</i> is found in a wide range of habitats. In China it grows on hillside meadows, in thickets, forests, roadsides and riverbanks (Flora of China Editorial Committee, 2017). Early collectors describe it as growing densely on dry hillsides in China (Diel, 1913) and Mack (2005) describes it as growing along roadsides in China. In its introduced range it is listed as growing in gardens, disturbed areas, roadsides, meadows and fields, pastures, among limestone boulders, in a pine forest, and along the banks of a river (NEWFS, 2017; New York Botanical Garden, 2017; Smithsonian Museum of Natural History, 2017)."
	Murphy, M. (2021). Plant Pono Specialist. BIISC Early Detection Technician. personal communication. 9 July	[Reported to form thicket in pastures affected by twolined spittle bug. Unclear if plants will exclude other vegetation, or are merely exploiting openings in former pasture] "Kawehi and Carolyn Wong found a huge thicket at Wall Ranch, Kealakekua. They were covered with seeds! Kawehi said they were like velcro."

501	Aquatic	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Wu, Z. Y. & P. H. Raven, eds. (1995). Flora of China. Vol. 16 (Gentianaceae through Boraginaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	[Terrestrial] "Hillside meadows, forests, thickets, roadsides, river banks; 2600-3700 m."

502	Grass	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 20 Jul 2021]	Family: Boraginaceae Subfamily: Cynoglossoideae Tribe: Cynoglosseae Subtribe: Cynoglossinae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 20 Jul 2021]	Family: Boraginaceae Subfamily: Cynoglossoideae Tribe: Cynoglosseae Subtribe: Cynoglossinae

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.	[Biennial. No evidence] "Biennial herbs 2-10 dm tall. Basal leaves lanceolate to oblong-oblancoelate, 6-17 cm long, 1-3 cm wide, gray canescent with fine, soft, usually appressed hairs, petioles 2-9 cm long."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	CABI. (2021). <i>Cynoglossum amabile</i> (Chinese forget-me-not). In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	[No evidence] " <i>Cynoglossum amabile</i> is a perennial herb in warmer climates but also grows as an annual in cooler climates. It is native to China and Bhutan but has also been widely planted as an ornamental plant around the world in temperate and tropical climates and is often naturalized where it is planted."

602	Produces viable seed	y
	Source(s)	Notes
	NC State Extension. (2021). <i>Cynoglossum amabile</i> . https://plants.ces.ncsu.edu/plants/cynoglossum-amabile/ . [Accessed 16 Aug 2021]	"Hardy biennial grown as an annual; prefers well-drained soil high in organic matter; average fertility; good drought tolerance; reseeds; prefers cool temperatures "

Qsn #	Question	Answer
	Murphy, M. (2021). Plant Pono Specialist. BIISC Early Detection Technician. personal communication. 9 July	"Kawehi and Carolyn Wong found a huge thicket at Wall Ranch, Kealakekua. They were covered with seeds! Kawehi said they were like velcro."
	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.	"Nutlets ovoid, compressed, 2.5-3 mm long, densely covered with barbed prickles."
	Dave's Garden. (2021). Chinese Forget-Me-Not - <i>Cynoglossum amabile</i> . https://davesgarden.com/guides/pf/go/258/ . [Accessed 16 Aug 2021]	"Propagation Methods: From seed"

603	Hybridizes naturally	
	Source(s)	Notes
	De Jong, T., Peter G. L. Klinkhamer, & Boorman, L. (1990). <i>Cynoglossum Officinale</i> L. <i>Journal of Ecology</i> , 78(4), 1123-1144	[Unknown. Hybridization documented in genus] "Hybrids. <i>Cynoglossum officinale</i> x <i>C. germanicum</i> Jacq. (= <i>C. modorense</i> Rech.) has nutlets with an indistinct border which are intermediate between the two species. It is listed for Austria, Czechoslovakia and Romania (Rechinger 1914; Brand 1921; Hegi Fl. ed. 1, 5(3); Hyb. Br. Isl.). Brand (1921) described <i>C. officinale</i> forma <i>hybridum</i> (Thuill.) Brand, an intermediate between <i>C. officinale</i> and <i>C. creticum</i> . Intermediates, resembling <i>C. officinale</i> in flower and <i>C. creticum</i> in leaf shape (broad, amplexicaul cauline) and colour (dull), have also been described from the west of Gambari, Italy (S. L. Jury, personal communication 1986) and Turkey (Riedl 1978) and might be viable hybrids between the two species. Hegi Fl. ed. 1, 5(3) describes <i>C. hungaricum</i> x <i>C. officinale</i> (= <i>C. austriacum</i> Rech.) for Hungary and southern Austria."

604	Self-compatible or apomictic	
	Source(s)	Notes
	Dave's Garden. (2021). Chinese Forget-Me-Not - <i>Cynoglossum amabile</i> . https://davesgarden.com/guides/pf/go/258/ . [Accessed 16 Aug 2021]	"These are very pretty, and will self-seed themselves freely."
	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.	[Genus description. Perfect flowers suggest self-compatibility as a possibility] "Flowers perfect, in ± scorpioid, paniculate or racemose cymes; calyx 5-lobed, spreading or recurved in fruit"
	de Jong, T. J., & Klinkhamer, P. G. (1989). Limiting factors for seed production in <i>Cynoglossum officinale</i> . <i>Oecologia</i> , 80(2), 167-172	[Unknown. Other species documented to be self-compatible] "Although it is clear that <i>C. officinale</i> can produce viable seeds after selfing (Table 3), we do not know whether there is complete self-compatibility (cf. Crowe 1971; Weller and Ornduff 1977; Olesen 1979; Philipp and Schou 1981 for other species of the Boraginaceae) and why the remaining flowers do not set seed."

605	Requires specialist pollinators	n
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Qsn #	Question	Answer
	Source(s)	Notes
	CABI. (2021). <i>Cynoglossum amabile</i> (Chinese forget-me-not). In: <i>Invasive Species Compendium</i> . Wallingford, UK: CAB International. www.cabi.org/isc	"Flowers are attractive to bee pollinators (Nogueira-Neto, 2002)." ... "In Brazil flowers are pollinated by various bee species including <i>Scaptotrigona postica</i> , <i>S. xanthotricha</i> , <i>Paratrigona</i> spp., <i>Melipona quadrifasciata</i> and <i>Apis mellifera</i> (Nogueira-Neto, 2002)."
	Nogueira-Neto, P. (2002). Management of plants to maintain and study pollinating bee species, and also to protect vertebrate frugivorous fauna. <i>Pollinating Bees-The Conservation Link Between Agriculture and Nature-Ministry of Environment/Brasilia</i> , 21-28	"MIOSÓTIS CHINÊS (<i>Cynoglossum amabile</i> Stapf & Drum). Nectar, in the State of São Paulo. It is a herbaceous plant, some 30-70 cm high, with blue flowers, miosotis like, in spikes. It sometimes attracts mandaguari (<i>S. postica</i>), mandaguari amarela (<i>S. xanthotricha</i>), mirim da terra (<i>Paratrigona</i> spp), mandaçaia (<i>M. quadrifasciata</i>) and <i>A. mellifera</i> ."

606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	CABI. (2021). <i>Cynoglossum amabile</i> (Chinese forget-me-not). In: <i>Invasive Species Compendium</i> . Wallingford, UK: CAB International. www.cabi.org/isc	[Annual or biennial reproduces by seeds] "Flowers are attractive to bee pollinators (Nogueira-Neto, 2002). Seeds mature about 20 days after pollination (Quinn et al., 1987). Garden plants freely self-seed (Missouri Botanical Garden, 2017). Seeds are dispersed by animals (Melcher et al., 2000)." ... "Plants grow as annuals in cooler climates but as biennials or perennials in warmer climates (Flora of China Editorial Committee, 2017; Missouri Botanical Garden, 2017),"

607	Minimum generative time (years)	1
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). <i>Manual of the flowering plants of Hawaii</i> . Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Biennial herbs 2-10 dm tall. Basal leaves lanceolate to oblong-oblongeolate, 6-17 cm long, 1-3 cm wide, gray canescent with fine, soft, usually appressed hairs, petioles 2-9 cm long."
	CABI. (2021). <i>Cynoglossum amabile</i> (Chinese forget-me-not). In: <i>Invasive Species Compendium</i> . Wallingford, UK: CAB International. www.cabi.org/isc	" <i>Cynoglossum amabile</i> is a perennial herb in warmer climates but also grows as an annual in cooler climates."

Qsn #	Question	Answer
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y
	Source(s)	Notes
	Melcher, I. M., Bouman, F., & Cleef, A. A. (2000). Seed dispersal in páramo plants: epizoochorous and hydrochorous taxa. <i>Plant Biology</i> , 2(01), 40-52	"Boraginaceae: the genera <i>Cynoglossum</i> (<i>C. amabile</i> ; Fig. 3) and <i>Hackelia</i> (<i>H. revoluta</i>) have several multiple hooks per nutlet"
	Webb, C. J., Sykes, W. R., & Garnock-Jones, P. J. (1988). <i>Flora of New Zealand Volume IV</i> . Botany Division, DSIR, Christchurch, New Zealand	[Common along roadsides] "N.: a cultivation escape in warmer areas, especially N. Auckland (Kerikeri, and north of Kaukapakapa and Helensville), Bay of Plenty (near Kawerau); S.: around Christchurch; K.: Raoul, naturalised along 1 km of rough road for many years. Waste places, roadsides."
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). <i>Manual of the flowering plants of Hawaii</i> . Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Prickles allow attachment to clothing, footwear, fur, etc] "Nutlets ovoid, compressed, 2.5-3 mm long, densely covered with barbed prickles."

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	CABI. (2021). <i>Cynoglossum amabile</i> (Chinese forget-me-not). In: <i>Invasive Species Compendium</i> . Wallingford, UK: CAB International. www.cabi.org/isc	" <i>Cynoglossum amabile</i> is a perennial herb in warmer climates but also grows as an annual in cooler climates. It is native to China and Bhutan but has also been widely planted as an ornamental plant around the world in temperate and tropical climates and is often naturalized where it is planted."
	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	[Cultivated in the Hawaiian Islands] "Chinese forget-me-not is better suited to cooler conditions at elevations above 1,000'. In Hawai'i, small-flowered plants have been mistaken for <i>C. zeylanicum</i> ."

703	Propagules likely to disperse as a produce contaminant	
	Source(s)	Notes
	WRA Specialist. (2021). Personal Communication	Unknown. Cultivated as an ornamental, and as a pollinator plant, and sold in seed packets. Could potentially become a contaminant of soil in potted plants, or in other ornamentals, although direct evidence is lacking. Primary mode of dispersal is by external attachment to animals and clothing

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). <i>Manual of the flowering plants of Hawaii</i> . Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Nutlets ovoid, compressed, 2.5-3 mm long, densely covered with barbed prickles."

705	Propagules water dispersed	y
	Source(s)	Notes

Qsn #	Question	Answer
	Novara, L. (2011). Boraginaceae. Aportes Botanicos de Salta-Serie Flora, 10(5), 1-65	[Translation from Spanish] "Species native to Asia, it has been introduced as an ornamental and has escaped from that state years ago, becoming aggressive especially in stream beds and torrential rivers of Selva Montana. It is less frequent in modified environments." [Cynoglossum amabile becoming dominant in stream beds and rivers, suggesting water, in addition to external attachment, facilitates dispersal]

706	Propagules bird dispersed	
	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.	[Possibly could adhere to bird feathers, but unlikely to be consumed and internally dispersed by birds] "Nutlets ovoid, compressed, 2.5-3 mm long, densely covered with barbed prickles."

707	Propagules dispersed by other animals (externally)	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.	"Nutlets ovoid, compressed, 2.5-3 mm long, densely covered with barbed prickles."
	Melcher, I. M., Bouman, F., & Cleef, A. A. (2000). Seed dispersal in páramo plants: epizoochorous and hydrochorous taxa. Plant Biology, 2(01), 40-52	"Table 1 Paramo families with adaptations to epizoochorous dispersal, weight class of the diaspores, and phytogeographic distribution" ... "Boraginaceae: the genera Cynoglossum (C. amabile; Fig. 3) and Hackelia (H. revoluta) have several multiple hooks per nutlet"

708	Propagules survive passage through the gut	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.	"Nutlets ovoid, compressed, 2.5-3 mm long, densely covered with barbed prickles." [Unlikely. Plants may have low palatability, and seeds adapted for external dispersal]

801	Prolific seed production (>1000/m2)	
	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.	[Densities unknown] "Fruit consisting of 4 nutlets, widely spreading at maturity, apically attached to the gynobase, flat on the back, covered with barbed or hooked prickles."

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes

Qsn #	Question	Answer
	Royal Botanic Gardens Kew. (2021) Seed Information Database (SID). Version 7.1. http://data.kew.org/sid/ . [Accessed 16 Aug 2021]	"Storage Behaviour: No data available for species. Of 18 known taxa of genus <i>Cynoglossum</i> , 100.00% Orthodox(p/?)"
	Baskin, C.C. & Baskin, J.M. 2014. <i>Seeds Ecology, Biogeography, and Evolution of Dormancy and Germination</i> . Second Edition. Academic Press, San Francisco, CA	"TABLE 10.32 Seed dormancy in herbaceous species of forested and nonforested areas in the boreal and north-temperate subalpine regions." [<i>Cynoglossum amabile</i> documented to have Physiological Dormancy]

803	Well controlled by herbicides	y
	Source(s)	Notes
	CABI. (2021). <i>Cynoglossum amabile</i> (Chinese forget-me-not). In: <i>Invasive Species Compendium</i> . Wallingford, UK: CAB International. www.cabi.org/isc	"Herbicides are used to control the closely related <i>C. officinale</i> (FEIS, 2017)."
	CABI. (2021). <i>Cynoglossum officinale</i> (hound's tongue). In: <i>Invasive Species Compendium</i> . Wallingford, UK: CAB International. www.cabi.org/isc	[Methods to control <i>C. officinale</i> would presumably be effective on <i>C. amabile</i>] "Picloram, dicamba, chlorsulfuron (Cranston and Ralph, 1983; Cranston et al., 1983; Cranston and Pethybridge, 1986; Cranston and Wood, 1986) and 2,4-D amine (Dickerson and Fay, 1982) have been reported to effectively control <i>C. officinale</i> (Upadhyaya et al., 1988). In Montana, USA, seed production of second year <i>C. officinale</i> plants was most affected by 2,4-D when it was applied to plants 28 cm high (Dickerson and Fay, 1982), whereas chlorsulfuron provided complete control from the beginning of the rosette state until the bolted plants were 28 cm tall (Dickerson and Fay, 1982)."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	Notes
	CABI. (2021). <i>Cynoglossum amabile</i> (Chinese forget-me-not). In: <i>Invasive Species Compendium</i> . Wallingford, UK: CAB International. www.cabi.org/isc	"Hand-pulling, hoeing and tilling are used to control the closely related <i>C. officinale</i> (FEIS, 2017)"

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. (2021). Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits

- Broad climate suitability
- Grows in temperate to tropical climates
- Naturalized on Hawaii and Maui (Hawaiian Islands); widely naturalized elsewhere
- A disturbance-adapted nuisance weed (due to barbed seeds) of yards and gardens
- A potential weed of rangelands and natural areas
- Other *Cynoglossum* species are invasive weeds
- Potentially allelopathic
- May be unpalatable to browsing and grazing animals
- Reported to be mildly toxic to horses if consumed in large quantities over a long period of time
- Tolerates many soil types
- Forms dense cover in pastures and hillsides, possibly due to disturbance; competitive effects on other vegetation unclear
- Reproduces by seeds
- A biennial that may reach maturity in <1 year in some climates
- Barbed seeds dispersed externally by attaching to animals and people, by water, and intentionally cultivated by people

Low Risk Traits

- Despite widespread naturalization and weedy behavior, negative impacts have generally not been documented
- Unarmed
- Grows in full sun to partial shade (dense shade may limit ability to establish or spread)
- Not reported to spread vegetatively
- Herbicides provide effective control of a related, invasive species, and would likely be effective in controlling *Cynoglossum amabile* if needed