

Taxon: <i>Gilia capitata</i>	Family: Polemoniaceae
Common Name(s): blue field gilia bluehead gilia globe gilia	Synonym(s): <i>Gilia glandulifera</i> A.Heller <i>Gilia pallida</i> A.Heller <i>Navarretia capitata</i> (Sims) Kuntze

Assessor: Assessor	Status: Assessor Approved	End Date: 22 Sep 2014
WRA Score: 6.5	Designation: H(HPWRA)	Rating: High Risk

Keywords: Annual, Wildflower, Naturalized, Self-Compatible, Bee-pollinated

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)	Low
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	n
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)	n
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed		
305	Congeneric weed		
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	y=1, n=0	n
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	n

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	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	y=1, n=-1	y
604	Self-compatible or apomictic	y=1, n=-1	y
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)		
702	Propagules dispersed intentionally by people	y=1, n=-1	y
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		
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)		
708	Propagules survive passage through the gut		
801	Prolific seed production (>1000/m ²)		
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	y
803	Well controlled by herbicides		
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
	Baldwin, B.G., Goldman, D.H., Keil, D.J., Patterson, R., & Rosatti, T.J. (eds.). 2012. The Jepson Manual. Vascular Plants of California, Second Edition, Thoroughly Revised and Expanded. University of California Press, Berkeley and Los Angeles	No evidence

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2014. 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"	Low
	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 from British Columbia south to California;"

202	Quality of climate match data	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.	

203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	Wildflower Information.org. 2006. Globe Gilia - <i>Gilia capitata</i> . http://www.wildflowerinformation.org/Wildflower.asp?ID=84 . [Accessed 19 Sep 2014]	[Can grow in >5 hardiness zones] "Zones: 3-10"
	Baldwin, B.G., Goldman, D.H., Keil, D.J., Patterson, R., & Rosatti, T.J. (eds.). 2012. The Jepson Manual. Vascular Plants of California, Second Edition, Thoroughly Revised and Expanded. University of California Press, Berkeley and Los Angeles	[Two subspecies have elevation ranges that exceed 1000 m] "subsp. <i>abrotanifolia</i> ... Sandy, loamy slopes; gen <1900(3018) m" ... "subsp. <i>capitata</i> ... Rocky slopes; 30-2400 m."

Qsn #	Question	Answer
204	Native or naturalized in regions with tropical or subtropical climates	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.	[Only at higher elevations] "in Hawaii sparingly naturalized on Haleakala, 2,400-2,500 m, Maui."

Qsn #	Question	Answer
205	Does the species have a history of repeated introductions outside its natural range?	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.	"in Hawaii sparingly naturalized on Haleakala, 2,400-2,500 m, Maui."
	Dave's Garden. 2014. PlantFiles: Queen Anne's Thimbles, Blue Thimble Flower, Globe Gilia - <i>Gilia capitata</i> . http://davesgarden.com/guides/pf/go/53225/ . [Accessed 22 Sep 2014]	[Planted outside native range of California] "This plant has been said to grow in the following regions: Phoenix, Arizona Canoga Park, California El Sobrante, California Richmond, California San Francisco, California Barbourville, Kentucky Bend, Oregon Stroudsburg, Pennsylvania Kalama, Washington Charleston, West Virginia"

Qsn #	Question	Answer
301	Naturalized beyond native range	y
	Source(s)	Notes
	Howell, C. J., & Sawyer, J. W. (2006). New Zealand naturalised vascular plant checklist. New Zealand Plant Conservation Network, Wellington, NZ	" <i>Gilia capitata</i> " ... "Naturalised plant status - Casual"
	Heenan, P. B., de Lange, P. J., Cameron, E. K., & Champion, P. D. 2002. Checklist of dicotyledons, gymnosperms, and pteridophytes naturalised or casual in New Zealand: additional records 199–2000. <i>New Zealand Journal of Botany</i> , 40(2): 155-174	" <i>Gilia capitata</i> " ... "NEW RECORD: AK 235777, A. E. Wright, 15 Jan 1998, Canterbury, Christchurch. NOTES: Occurs in a dry street frontage."
	Mohlenbrock, R.H. 1990. The illustrated flora of Illinois: Flowering plants: Nightshades to Mistletoe. SIU Press, Carbondale, IL	"Illinois Distribution: Known only as a garden escape in Putnam County. <i>Gilia capitata</i> is an infrequently grown and highly variable garden ornamental in Illinois. Its collection from Illinois adjacent to a garden casts doubt as to its spontaneity in Illinois."
	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.	"in Hawaii sparingly naturalized on Haleakala, 2,400-2,500 m, Maui. First collected in 1929 (Swezey s.n., BISH)."

Qsn #	Question	Answer
	Dehnen-Schmutz, K., Touza, J., Perrings, C., & Williamson, M. 2007. The horticultural trade and ornamental plant invasions in Britain. <i>Conservation Biology</i> , 21(1): 224-231	"Ornamental horticulture has been recognized as the main pathway for plant invasions worldwide. We examined the link between propagule pressure created by the presence of ornamental plants in the market and their ability to escape from cultivation and establish in the wild. A random sample of 534 non-native ornamental species on sale in nineteenth century Britain showed that 27% of these species were recorded growing outside cultivation and 30% of those were established. Species that had escaped from cultivation were more frequently on sale both in the nineteenth century and today than nonescaping species." ... "We refer to species known outside cultivation as escaping and categorized them as casual (i.e., not persisting in Britain without reintroduction, unlikely to be permanent" ... "Table 3. The 26 species available from four or more nurseries out of eight in the 1860s and their availability from nurseries today (according to the Plant Finder [Lord 1987; Royal Horticultural Society 2004])." [<i>Gilia capitata</i> - Status = Casual]
	Medeiros, A.C., Loope, L.L. & Chimera, C.G. 1998. Flowering Plants and Gymnosperms of Haleakala National Park. Technical Report 120. Pacific Cooperative Studies Unit, Honolulu, HI	"West slope, gulch below road at 8400 ft. This lavender-flowered annual herb was first collected in the state and the Park in 1929 (m Swezey s.n.), then in 1980 (R.J. Nagata s.n.) and 1982 (K.M. Nagata & R.J. Nagata 2572). Collected outside Park in Kula in 1932 (Mrs. Blanche Walker s.n.). The sole known population of this species in the state currently occurs in the Park at 8400 ft. This species is only sparsely reproducing in the Park."

302	Garden/amenity/disturbance weed	n
	Source(s)	Notes
	Invasive Plant Council of British Columbia. 2011. Grow Me Instead - Beautiful Non-Invasive Plants for your Garden. Version Two: A Guide for British Columbia. www.bcinvasiveplants.com	[Recommended as a desirable alternative to the invasive Mountain Bluet (<i>Centaurea Montana</i>)]
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

Qsn #	Question	Answer
304	Environmental weed	
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Includes <i>Gilia capitata</i> in a list of Environmental weeds, but no details on negative impacts were found]
	Medeiros, A.C., Loope, L.L. & Chimera, C.G. 1998. Flowering Plants and Gymnosperms of Haleakala National Park. Technical Report 120. Pacific Cooperative Studies Unit, Honolulu, HI	[No evidence] "The sole known population of this species in the state currently occurs in the Park at 8400 ft. This species is only sparsely reproducing in the Park."

305	Congeneric weed	
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Several species listed as escaped or naturalized, but no information found on any significant impacts as invasive weeds] "Gilia achilleifolia - naturalized and a cultivation escape Gilia inconspicua - Casual alien Gilia laciniata - Casual alien Gilia micrantha - Casual alien Gilia multicaulis - Casual alien, cultivation escape Gilia pungens - Weed (of undetermined impacts) Gilia rigidula - Weed (of undetermined impacts) Gilia tricolor - Naturalized & casual alien"

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.	"Annual herbs 2-8 dm tall, glabrous to glandular or ± floccose, upper 1/3 of plant branched. Basal and lower leaves bipinnately dissected, 4-10 cm long, the ultimate segments 1-7 mm long, 0.2-1 mm wide, upper leaves much-reduced."

402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	Unknown

403	Parasitic	n
	Source(s)	Notes
	Kubitzki, K. (ed.). 2004. The Families and genera of vascular plants. Volume VI. Flowering plants, Dicotyledons: Celastrales, Oxalidales, Rosales, Cornales, Ericales. Springer-Verlag, Berlin, Heidelberg, New York	[No evidence] "Polemoniaceae" ... "Annual or perennial herbs, sometimes vines or woody shrubs, rarely small trees;"

404	Unpalatable to grazing animals	

Qsn #	Question	Answer
	Source(s)	Notes
	Swallowtail Garden Seeds. 2014. Deer Resistant Plants. http://www.swallowtailgardenseeds.com/tips_lists/deer_resistant_list.html#gsc.tab=0 . [Accessed 22 Sep 2014]	[Palatable, but possibly not preferred] "Gilia capitata = Occasionally Browsed"
	Dave's Garden. 2014. PlantFiles: Queen Anne's Thimbles, Blue Thimble Flower, Globe Gilia - <i>Gilia capitata</i> . http://davesgarden.com/guides/pf/go/53225/ . [Accessed 22 Sep 2014]	[Possibly unpalatable to deer] "Put a cage over it initially so the deer don't munch it before it gets going, they don't seem to like it all that much though as I have plenty of uncaged that have made it to seed."

405	Toxic to animals	n
	Source(s)	Notes
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence

406	Host for recognized pests and pathogens	n
	Source(s)	Notes
	The Royal Horticultural Society. 2014. <i>Gilia capitata</i> - Blue thimble flower. https://www.rhs.org.uk/plants/details?plantid=877 . [Accessed 22 Sep 2014]	"Pests Generally pest free Diseases Generally disease free "

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	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
	S&S Seeds. 2014. <i>Gilia capitata</i> . http://www.ssseeds.com/product/Gilia-capitata.aspx . [Accessed 22 Sep 2014]	"Characteristics / Comments: fire retardant properties Fire Resistant / Low Fuel: True"
	Keeley, J.E. . Bond, W.J., Bradstock, R.A., Pausas, J.G. & Rundel, P.W.. 2012. Fire in Mediterranean Ecosystems. Cambridge University Press, Cambridge, UK	"Table 5.2. Examples of postfire annuals in California chaparral and yearly distribution of total population recorded during the first 5 yrs" [<i>Gilia capitata</i> among those plants stimulated by fire]
	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.	[An annual herb unlikely to accumulate biomass that contributes to wildfires] "Annual herbs 2-8 dm tall, glabrous to glandular or ± floccose, upper 1/3 of plant branched."

409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	Notes

Qsn #	Question	Answer
	Lady Bird Johnson Wildflower Center. 2014. Native Plant Database - <i>Gilia capitata</i> . http://www.wildflower.org/plants/result.php?id_plant=GICA5 . [Accessed 22 Sep 2014]	"Light Requirement: Sun"
	Dave's Garden. 2014. PlantFiles: Queen Anne's Thimbles, Blue Thimble Flower, Globe Gilia - <i>Gilia capitata</i> . http://davesgarden.com/guides/pf/go/53225/ . [Accessed 22 Sep 2014]	"Sun Exposure: Full Sun"
	Wildflower Information.org. 2006. Globe Gilia - <i>Gilia capitata</i> . http://www.wildflowerinformation.org/Wildflower.asp?ID=84 . [Accessed 19 Sep 2014]	"Sun/Shade: Full sun to partial shade"

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	The Xerces Society. 2014. Farming with Native Beneficial Insects: Ecological Pest Control Solutions. Storey Publishing, North Adams, MA	" <i>Gilia</i> is a low-cost species suitable for insectary plantings and native plant field borders. It is relatively easy to start from seed, tolerates a range of soil conditions, and is attractive to many different species of nectar-drinking beneficial insects."
	Wildflower Information.org. 2006. Globe Gilia - <i>Gilia capitata</i> . http://www.wildflowerinformation.org/Wildflower.asp?ID=84 . [Accessed 19 Sep 2014]	"Soil preference: Adaptable"

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 2-8 dm tall, glabrous to glandular or ± floccose, upper 1/3 of plant branched."

412	Forms dense thickets	n
	Source(s)	Notes
	Medeiros, A.C., Loope, L.L. & Chimera, C.G. 1998. Flowering Plants and Gymnosperms of Haleakala National Park. Technical Report 120. Pacific Cooperative Studies Unit, Honolulu, HI	[No evidence in Haleakala National Park] "The sole known population of this species in the state currently occurs in the Park at 8400 ft. This species is only sparsely reproducing in the Park."
	Thomas, J.H. 1961. Flora of the Santa Cruz Mountains of California: A Manual of the Vascular Plants. Stanford University Press, Stanford, CA	[No evidence] " <i>G. capitata</i> Sims ssp <i>capitata</i> ... Occasional in the Santa Cruz Mountains" ... " <i>G. capitata</i> Sims ssp. <i>chamissonis</i> ... Sand dunes in San Francisco" ... " <i>G. capitata</i> Sims ssp. <i>staminea</i> ... Rather rare in the Santa Cruz Mountains ... "

Qsn #	Question	Answer
501	Aquatic	n
	Source(s)	Notes
	Kubitzki, K. (ed.). 2004. The Families and genera of vascular plants. Volume VI. Flowering plants, Dicotyledons: Celastrales, Oxalidales, Rosales, Cornales, Ericales. Springer-Verlag, Berlin, Heidelberg, New York	[Genus of terrestrial plants] "About 50 spp., shrublands, woodlands, and forests of W North America."

502	Grass	n
	Source(s)	Notes
	Kubitzki, K. (ed.). 2004. The Families and genera of vascular plants. Volume VI. Flowering plants, Dicotyledons: Celastrales, Oxalidales, Rosales, Cornales, Ericales. Springer-Verlag, Berlin, Heidelberg, New York	Polemoniaceae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	Kubitzki, K. (ed.). 2004. The Families and genera of vascular plants. Volume VI. Flowering plants, Dicotyledons: Celastrales, Oxalidales, Rosales, Cornales, Ericales. Springer-Verlag, Berlin, Heidelberg, New York	"Polemoniaceae" ... "Gilia" ... "Annuals or herbaceous to suffrutescent perennials, rarely subshrubs; basal leaves often in a rosette, often senescent at bolting, cauline leaves alternate, abruptly to gradually reduced in size; pubescence eglandular or glandular."

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Kubitzki, K. (ed.). 2004. The Families and genera of vascular plants. Volume VI. Flowering plants, Dicotyledons: Celastrales, Oxalidales, Rosales, Cornales, Ericales. Springer-Verlag, Berlin, Heidelberg, New York	"Annual herbs 2-8 dm tall, glabrous to glandular or ± floccose, upper 1/3 of plant branched."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Nagy, E. S., & Rice, K. J. 1997. Local adaptation in two subspecies of an annual plant: implications for migration and gene flow. <i>Evolution</i> ,51(4): 1079-1089	[No evidence of substantial reproductive failure] "Gilia c. capitata is common on the dry rocky slopes of central and northern California's Coast Range." ... "Gilia c. chamissonis (E. Greene) V. Grant is more limited in distribution and is found only on the coastal sand dunes of central California."

602	Produces viable seed	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.	"Capsules subglobose, 3-4 mm in diameter, indehiscent or tardily dehiscent, disarticulating on the stipe above the calyx. Seeds 1-6(-10), ovoid, ± angled, 1.6-2 mm long."

Qsn #	Question	Answer
	The Xerces Society. 2014. Farming with Native Beneficial Insects: Ecological Pest Control Solutions. Storey Publishing, North Adams, MA	"Gilia is a low-cost species suitable for insectary plantings and native plant field borders. It is relatively easy to start from seed, tolerates a range of soil conditions, and is attractive to many different species of nectar-drinking beneficial insects."

603	Hybridizes naturally	y
	Source(s)	Notes
	Grant, V. 1966. The selective origin of incompatibility barriers in the plant genus <i>Gilia</i> . <i>American Naturalist</i> , 100 (911): 99-118	"In several species of <i>Gilia</i> a definite but surmountable barrier to crossing is developed between particular geographical races which produce highly fertile F1 hybrids. This is the case in <i>Gilia capitata</i> , <i>G. achilleaefolia</i> , and <i>G. ochroleuca</i> (Grant, 1950, 1952a, 1954a; Grant and Grant, 1960)."
	Grant, V. 1953. The Role of Hybridization in the Evolution of the Leafy-Stemmed <i>Gilias</i> . <i>Evolution</i> , 7(1): 51-64	"In the first place, there is morphological evidence of introgressive hybridization between some of the species, as for example between <i>G. capitata pacifica</i> and <i>G. millefoliata</i> on Cape Mendocino; between <i>G. capitata abrotanifolia</i> and <i>G. angelensis</i> in Santa Ana Canyon in the Santa Ana Mountains; and between <i>G. capitata staminea</i> and <i>G. achilleaefolia</i> in the Inner South Coast Range near Coalinga. In each case a population deviates in its morphological characters from the norm of its species and approaches the conditions found in some other species with which it is growing. The characteristics of the plants are such as to suggest initial crossing followed by backcrossing to one or the other parental species. The deviating populations are fully fertile in the wild and their progeny, in those cases where they have been grown, are fertile also in the experimental garden."

604	Self-compatible or apomictic	y
	Source(s)	Notes
	Grant, V. 1953. The Role of Hybridization in the Evolution of the Leafy-Stemmed <i>Gilias</i> . <i>Evolution</i> , 7(1): 51-64	" <i>Gilia capitata</i> contains both self-compatible and self-incompatible races, all of which depend upon insects, mainly bees, for pollination."

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 50-100, sessile, in terminal heads 1.4-4 cm in diameter; calyx ca. 3-4 mm long, the lobes acute, ca. 2 mm long, joined below by the membranous sinus; corolla pale bluish violet, 6-8 mm long, the lobes 2-4 mm long."
	Nagy, E. S., & Rice, K. J. 1997. Local adaptation in two subspecies of an annual plant: implications for migration and gene flow. <i>Evolution</i> , 51(4): 1079-1089	"The subspecies are insect-pollinated and are serviced by a variety of bees (Grant and Grant 1965; Nagy 1995). Dense capitata inflorescences present purple-colored flowers and offer rewards of nectar and pollen."

606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes

Qsn #	Question	Answer
	Schmidt, M.G. 1980. Growing California Native Plants. University of California Press, Berkeley and Los Angeles, CA	[Annual. No evidence of vegetative spread] "Culture: Gilias may be planted from seed broadcast in late autumn to early spring, but they germinate more freely when planted with the early autumn rains. If allowed to go to seed, they will usually provide volunteers the following season."
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.	[Reaches maturity in 1 growing season] "Annual herbs 2-8 dm tall, glabrous to glandular or ± floccose, upper 1/3 of plant branched."
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	
	Source(s)	Notes
	Morrell, P. L., & Rieseberg, L. H. 1998. Molecular tests of the proposed diploid hybrid origin of <i>Gilia achilleifolia</i> (Polemoniaceae). American Journal of Botany, 85(10): 1439-1453	[Unknown. No means of external attachment, but small size could allow for adherence to vehicles or footwear in mud or soil] " <i>Gilia capitata</i> ssp. <i>staminea</i> occurs on sandy soil, often at the edge of cultivated fields and along roadsides."
702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Lady Bird Johnson Wildflower Center. 2014. Native Plant Database - <i>Gilia capitata</i> . http://www.wildflower.org/plants/result.php?id_plant=GICA5 . [Accessed 22 Sep 2014]	"Conditions Comments: Globe gilia self-sows readily and is a common component of wildflower seed mixes."
703	Propagules likely to disperse as a produce contaminant	y
	Source(s)	Notes
	Verdcourt, B. 2004. Additions to the Wild Fauna and Flora of the Royal Botanic Gardens, Kew XXXV. Miscellaneous Records. Kew Bulletin, 59(4): 639-649	[Compost contaminant] "t* <i>Gilia capitata</i> Sims. BLUE-THIMBLE-FLOWER. Flowerbed in front of the Herbarium, 26.vi.2001, T A. Cope. Presumably introduced in compost."

Qsn #	Question	Answer
704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Casper, B. B., & Wiens, D. 1981. Fixed rates of random ovule abortion in <i>Cryptantha flava</i> (Boraginaceae) and its possible relation to seed dispersal. <i>Ecology</i> , 62(3): 866-869	[Seeds dehiscent or not, but otherwise not adapted for wind dispersal] "A reduced seed set per flower may also be important for seed dispersal in <i>Gilia capitata</i> Sims. subsp. <i>capitata</i> (Polemoniaceae) which matures only 1 to 6 of the 14 ovules per capsule. Unlike other <i>gilia</i> s, the fruit of this subspecies remains indehiscent and falls from the plant as a unit (V. Grant 1950 and personal communication). In both <i>G. capitata</i> subsp. <i>chamissonis</i> (Greene) V. Grant and <i>G. capitata</i> subsp. <i>staminea</i> (Greene) V. Grant, all ovules within the ovary may develop, and seeds are released individually from a typically dehiscent capsule."

705	Propagules water dispersed	
	Source(s)	Notes
	Nagy, E. S., & Rice, K. J. 1997. Local adaptation in two subspecies of an annual plant: implications for migration and gene flow. <i>Evolution</i> , 51(4): 1079-1089	[Probably moved by overland water flow] " <i>Gilia c. capitata</i> is common on the dry rocky slopes of central and northern California's Coast Range." ... " <i>Gilia c. chamissonis</i> (E. Greene) V. Grant is more limited in distribution and is found only on the coastal sand dunes of central California." ... "Seeds of both subspecies are small (1-2 mm) and hard when dry, but possess a sticky mucilaginous coat that expands when wet, and likely serves to anchor seeds to the coarse, sandy substrate. Seeds may also adhere to a mobile substrate, and thereby disperse."

706	Propagules bird dispersed	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.	"Capsules subglobose, 3-4 mm in diameter, indehiscent or tardily dehiscent, disarticulating on the stipe above the calyx. Seeds 1-6(-10), ovoid, ± angled, 1.6-2 mm long."

707	Propagules dispersed by other animals (externally)	
	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. No means of external attachment, but small size could allow for attachment to animals in mud stuck to fur, or feet] "Seeds 1-6(-10), ovoid, ± angled, 1.6-2 mm long."

708	Propagules survive passage through the gut	
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	Unknown, but unlikely to be consumed & internally dispersed

Qsn #	Question	Answer
801	Prolific seed production (>1000/m ²)	
	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, but small seeded] "Annual herbs 2-8 dm tall, glabrous to glandular or ± floccose, upper 1/3 of plant branched." ... "Seeds 1-6(-10), ovoid, ± angled, 1.6-2 mm long."

802	Evidence that a persistent propagule bank is formed (>1 yr)	y
	Source(s)	Notes
	Baskin, C.C. & Baskin, J.M. 2014. Seeds Ecology, Biogeography, and Evolution of Dormancy and Germination. Second Edition. Academic Press, San Francisco, CA	[Possesses physiological dormancy] "TABLE 10.4 Dormancy in seeds of herbaceous species of matorral vegetation. *5type of dormancy is inferred. W, listed as a weed in Holm et al. (1979); g.h., greenhouse." ... "Gilia capitata - D/NDa = PD*"
	Royal Botanic Gardens Kew. 2008. Seed Information Database (SID). Version 7.1. http://data.kew.org/sid/ . [Accessed 22 Sep 2014]	[Seeds retain viability for years with open storage. Can likely persist in soil for >1 year] "Storage Conditions: 58% germination following 10 years open storage (Harrington, 1972); viability is halved after >10 years open storage (Priestley, 1986); long-term storage under IPGRI preferred conditions at RBGKew, WP. Oldest collection 15 years; germination change 100 to 100%, 14 years, 1 collection"

803	Well controlled by herbicides	
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	Unknown. No information on herbicide efficacy or chemical control of this species, & generally regarded as a desirable plant where grown.

804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	Notes
	Royal Botanic Gardens Kew. 2008. Seed Information Database (SID). Version 7.1. http://data.kew.org/sid/ . [Accessed 22 Sep 2014]	[Tolerates some pruning of flowers] "Pruning Cut back after flowering "

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits

- Elevation range exceeds 1000 m, and can grow in >5 hardiness zones demonstrating environmental versatility
- Naturalized on Maui, Hawaiian Islands & possible elsewhere
- Tolerates many soil types
- Seeds dispersed by gravity, possibly water & intentionally by people
- Hybridizes with other *Gilia* species
- Self-compatible
- Annual. Reaches maturity in <1 year
- Seeds able to be stored for extended periods; May form a persistent seed bank
- Able to coppice & resprout after cutting

Low Risk Traits

- Despite naturalization, no reports of negative impacts documented
- Mediterranean to temperate climate species (may only become established at higher elevations in the tropics)
- Unarmed (no spines, thorns or burrs)
- No reports of toxicity
- Ornamental
- Beneficial to bees and other pollinators
- Not reported to spread vegetatively