

Taxon: <i>Nemophila maculata</i>	Family: Boraginaceae
Common Name(s): fivespot	Synonym(s):

Assessor: Assessor	Status: Assessor Approved	End Date: 18 Sep 2014
WRA Score: 2.0	Designation: L	Rating: Low Risk

Keywords: Annual, Wildflower, Cultivation Escape, Bee-Pollinated, Ant-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)	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		
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	n
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	n
305	Congeneric weed		
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	y
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y

Qsn #	Question	Answer Option	Answer
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	n
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)		
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		
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	y
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)		
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	n
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	[Wildflower. 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
	USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed 18 Sep 2014]	"Native: (links to other web resources are provided for some distributions) NORTHERN AMERICA (Check conservation status in U.S. & Canada in NatureServe Explorer database) Southwestern U.S.A.: United States - California [c.]"

202	Quality of climate match data	High
	Source(s)	Notes
	USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed]	

Qsn #	Question	Answer
203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	Outsidepride.com. 2014. Five Spot Seeds. http://www.outsidepride.com/seed/flower-seed/nemophila/five-spot-wildflower-seed.html . [Accessed 17 Sep 2014]	[Can be grown in >5 hardiness zones] "USDA Zones: 3 - 9"
	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	[Elevation range exceeds 1000 m, demonstrating environmental versatility] "Meadows, roadbanks, woodland; 60-3100 m."

Qsn #	Question	Answer
204	Native or naturalized in regions with tropical or subtropical climates	n
	Source(s)	Notes
	Schmidt, M.G. & Greenberg, K.L. 2012. Growing California Native Plants, Second Edition: Expanded and Updated. University of California Press, Berkeley and Los Angeles, CA	"Native to moist places on the western slopes on the Sierra Nevada..."
	USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed 18 Sep 2014]	"Native: NORTHERN AMERICA (Check conservation status in U.S. & Canada in NatureServe Explorer database) Southwestern U.S.A.: United States - California [c.]"

Qsn #	Question	Answer
205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	Dave's Garden. 2014. PlantFiles: Baby Blue Eyes, Five Spot - <i>Nemophila maculate</i> . http://davesgarden.com/guides/pf/go/234/ . [Accessed 18 Sep 2014]	[Native to California. Cultivated in several locations outside native range] "This plant has been said to grow in the following regions: Kodiak, Alaska Clayton, California El Sobrante, California Los Angeles, California Merced, California Redwood City, California Richmond, California Sacramento, California San Jose, California (2 reports) Mount Prospect, Illinois Mathiston, Mississippi Binghamton, New York Hulbert, Oklahoma San Antonio, Texas Salt Lake City, Utah Seattle, Washington"

Qsn #	Question	Answer
301	Naturalized beyond native range	
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[C - Cultivation Escape Species may have escaped from gardens, cultivation or both] "Nemophila maculata Benth. ex Lindl. Hydrophyllaceae Cultivated 314-C"
	WRA Specialist. 2014. Personal Communication	Other than designation as a cultivation escape, no evidence of naturalization found

302	Garden/amenity/disturbance 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

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

304	Environmental 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

305	Congeneric weed	
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	Nemophila aphylla listed as a weed of unspecified impacts. Nemophylla menziesii listed as naturalized and as a cultivation escape

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Abrams, L. & Ferris, R.S. 1923. An Illustrated Flora of the Pacific States: Geraniaceae to Scrophulariaceae, geraniums to figworts. Stanford University Press, Stanford, CA	[No evidence] "Stems succulent, loosely hispid or glabrate, 1-3 dm. long. Leaves all opposite, oval or oblong with a cuneate base, 0.8-2 cm. long, 0.3-0.8 cm. broad, pinnately and deeply 5-9-lobed, the lobes lanceolate to orbicular, the petioles equaling or exceeding the blade, the upper leaves nearly sessile, 3-toothed to entire, all hispid to hirsute, with stomata on both surfaces"

Qsn #	Question	Answer
402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	Unknown

403	Parasitic	n
	Source(s)	Notes
	Munz, P.A. 1959. A California Flora. University of California Press, Berkeley and Los Angeles, CA	[No evidence. Annual herb. Boraginaceae] "Stems several; decumbent, loosely hairy or glabrate, 1-3 dm. long; lvs. opposite, oblong to oval in outline, 1-3 cm. long, pinnately and deeply 5-9-lobed (or tile upper entire to 3-lobed), hirsute, tile petioles equally long"

404	Unpalatable to grazing animals	
	Source(s)	Notes
	United States Department of Agriculture - Natural Resources Conservation Service. 2014. Conservation Plant Characteristics - <i>Nemophila maculate</i> . https://plants.usda.gov/java/charProfile?symbol=NEMA&format=print . [Accessed 18 Sep 2014]	"Palatable Browse Animal: Unknown Palatable Graze Animal: Unknown"
	Mullins, A. 2014. Field-edge planting to deter white-tailed deer and attract carabid beetles in soybean fields. MS Thesis. Dalhousie University, Halifax, Nova Scotia	[Related species deer-resistant. Genus may be unpalatable to deer] "deer-resistant flower mix" [Includes Baby Blue-Eyes = <i>Nemophila menziesii</i>]

405	Toxic to animals	n
	Source(s)	Notes
	FindTheBest.com, Inc. 2014. <i>Nemophila maculate</i> . http://plants.findthebest.com/l/1847/Nemophila-maculata . [Accessed 18 Sep 2014]	"Toxicity: None"
	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>Nemophila maculate</i> - Five spot baby. https://www.rhs.org.uk/plants/details?plantid=1323 . [Accessed 17 Sep 2014]	"Pests Can be attacked by aphids Diseases Generally disease free"
	Shoot Gardening. 2014. <i>Nemophila maculata</i> (Five spot). http://www.shootgardening.co.uk/plant/nemophila-maculata?referrer=%2Fplant%2Fselect%2Fidentify-results%3F . [Accessed 18 Sep 2014]	"Watch out for Specific pests: Aphids "

407	Causes allergies or is otherwise toxic to humans	n

Qsn #	Question	Answer
	Source(s)	Notes
	FindTheBest.com, Inc. 2014. <i>Nemophila maculata</i> . http://plants.findthebest.com/l/1847/Nemophila-maculata . [Accessed 18 Sep 2014]	"Toxicity: None"
	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
	Abrams, L. & Ferris, R.S. 1923. An Illustrated Flora of the Pacific States: Geraniaceae to Scrophulariaceae, geraniums to figworts. Stanford University Press, Stanford, CA	[A succulent annual unlikely to accumulate biomass that contributes to wildfires] "Stems succulent, loosely hispid or glabrate..."
	Schmidt, M.G. & Greenberg, K.L. 2012. Growing California Native Plants, Second Edition: Expanded and Updated. University of California Press, Berkeley and Los Angeles, CA	[Unlikely given habitat and annual growth habit] "Distribution: Moist slopes and meadows."

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	Notes
	Payne, T. 1910. California Wild Flowers, Their Culture and Care. Theodore Payne, Los Angeles, CA	"Annuals for shady and partially shady places. <i>Nemophila aurita</i> , <i>Nemophila insignis</i> , <i>Nemophila maculata</i> ..."
	Schmidt, M.G. & Greenberg, K.L. 2012. Growing California Native Plants, Second Edition: Expanded and Updated. University of California Press, Berkeley and Los Angeles, CA	"Sun to partial shade"
	Seedaholic. 2013. <i>Nemophila maculata</i> 'Five Spot'. http://www.seedaholic.com/nemophila-maculata-five-spot.html . [Accessed 17 Sep 2014]	"The plant is also perfect for shaded areas, in fact, the genus name 'nemophila' actually means 'shade-lover'."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Schmidt, M.G. & Greenberg, K.L. 2012. Growing California Native Plants, Second Edition: Expanded and Updated. University of California Press, Berkeley and Los Angeles, CA	"Soil: Adaptable"
	Outsidepride.com. 2014. Five Spot Seeds. http://www.outsidepride.com/seed/flower-seed/nemophila/five-spot-wildflower-seed.html . [Accessed 17 Sep 2014]	"This wild flower species will tolerate a variety of conditions, and doesn't seem to care whether soil is heavy or sandy."

411	Climbing or smothering growth habit	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Quattrocchi, U.. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"Herb, low-growing, slender, branching, pinnately lobed leaves, white open bowl-shaped flowers, petals with deep purple spot at the tip, forage."

412	Forms dense thickets	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 from native range. Annual growth habit would likely prevent formation of persistent dense stands] "Meadows, roadbanks, woodland; 60-3100 m."

501	Aquatic	n
	Source(s)	Notes
	Wiese, K. 2013. Sierra Nevada Wildflowers. Morris Book Publishing, Kearney, NE	[Terrestrial] "Habitat/Range: Open areas, especially meadows, in foothill woodland, and mixed coniferous, upper montane, and subalpine forests, below 10,000'."

502	Grass	n
	Source(s)	Notes
	USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed 17 Sep 2014]	"Family: Boraginaceae subfamily: Hydrophylloideae. Also placed in: Hydrophyllaceae"

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed 17 Sep 2014]	"Family: Boraginaceae subfamily: Hydrophylloideae. Also placed in: Hydrophyllaceae"

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Quattrocchi, U.. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"Herb, low-growing, slender, branching, pinnately lobed leaves, white open bowl-shaped flowers, petals with deep purple spot at the tip, forage."

Qsn #	Question	Answer
601	Evidence of substantial reproductive failure in native habitat	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
602	Produces viable seed	y
	Source(s)	Notes
	Schmidt, M.G. & Greenberg, K.L. 2012. Growing California Native Plants, Second Edition: Expanded and Updated. University of California Press, Berkeley and Los Angeles, CA	"Species of nemophila are easily grown from seed broadcast in autumn, and seeds may be sown again in early spring for late bloom. Most will volunteer abundantly when allowed to go to seed."
603	Hybridizes naturally	n
	Source(s)	Notes
	Chittenden, R. J. 1928. Notes on species crosses in <i>Primula</i> , <i>Godetia</i> , <i>Nemophila</i> and <i>Phacelia</i> . <i>Journal of Genetics</i> 19: 285-314	[Intersterile] "Six species have been examined in <i>Nemophila</i> (<i>N. liniflora</i> , <i>N. atomaria</i> , <i>N. insignis</i> , <i>N. integrifolia</i> , <i>N. maculata</i> and <i>N. aurita</i>), four of which (<i>integrifolia</i> , <i>liniflora</i> , <i>atomaria</i> and <i>insignis</i>) are closely allied. In all those examined cytologically n = 9. All the species are completely intersterile."
604	Self-compatible or apomictic	
	Source(s)	Notes
	Cruden, R. W. 1972. Pollination biology of <i>Nemophila menziesii</i> (Hydrophyllaceae) with comments on the evolution of oligolectic bees. <i>Evolution</i> , 26(3): 373-389	[Other <i>Nemophila</i> species are self-compatible] " <i>Nemophila menziesii</i> s.l. is a species aggregate of three closely related but distinct species (Cruden, 1972) and will be referred to as <i>Nemophila</i> agg." ... "The flowers of <i>Nemophila</i> agg. are prot- androus (Fig. 5) and self-compatible."
605	Requires specialist pollinators	n
	Source(s)	Notes
	Cruden, R. W. 1972. Pollination biology of <i>Nemophila menziesii</i> (Hydrophyllaceae) with comments on the evolution of oligolectic bees. <i>Evolution</i> , 26(3): 373-389	"Although the flowers of <i>Nemophila</i> agg. are visited by individuals of many orders, Hymenoptera and Diptera usually compose 90% or more of the flower visitors. Throughout most of its distribution range four species of bees are the primary pollinators, viz. <i>Apis mellifera</i> , <i>Andrena macrocephala</i> , <i>Andrena torulosa</i> and <i>Andrena crudeni</i> . These bees are medium sized and have behavioral patterns which make them efficient pollinators." ... "In the central and southern Sierra Nevada, the region in which <i>A. macrocephala</i> and <i>A. crudeni</i> are frequently found in large numbers, the polylectic bees have not been taken on <i>N. menziesii</i> although they have been taken on nearby populations of <i>N. maculata</i> ."

Qsn #	Question	Answer
606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	FindTheBest.com, Inc. 2014. <i>Nemophila maculata</i> . http://plants.findthebest.com/l/1847/Nemophila-maculata . [Accessed 18 Sep 2014]	"Propagation: Seed Vegetative Spread Rate: None"
607	Minimum generative time (years)	1
	Source(s)	Notes
	Outsidepride.com. 2014. Five Spot Seeds. http://www.outsidepride.com/seed/flower-seed/nemophila/five-spot-wildflower-seed.html . [Accessed 17 Sep 2014]	"Five Spot <i>Nemophila Maculata</i> is a annual wild flower that easily and quickly grows from wild flower seeds. It is a hardy annual that grows very, very fast and blooms profusely, and it dies back with the first frost of fall. Although an annual, Five Spot may re-seed if the seeds fall on bare ground."
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	
	Source(s)	Notes
	Munz, P.A. 1959. <i>A California Flora</i> . University of California Press, Berkeley and Los Angeles, CA	[Unknown. No means of external attachment, but small size could allow for adherence to vehicles or footwear in mud or soil] "seeds 5-12, ovoid, smooth or shallowly pitted, ca. 2 mm."
702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	GrowOrganic.com. 2014. PV Flowering Pollinator Mix. http://www.groworganic.com/pv-flowering-pollinator-mix-lb.html . [Accessed]	[Five Spot = <i>Nemophila maculata</i> . Sold in commercial seed mix] 'Annuals and Biennial Open Pollinated. Attracts a wide range of insects and pollinators. Contains: Arroyo Lupine, Golden Lupine, Chinese Houses, Five Spot, California Poppy, Lacey Phacelia, Baby Blue Eyes, Dwarf Sunflower, White Alyssum, Globe Gilia, Tidy Tips, Bird's Eyes, and Primrose. 1/4 lb covers approximately 500 sq ft if broadcast."
703	Propagules likely to disperse as a produce contaminant	
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	Grown as a cover crop and to attract and benefit pollinators. Seeds could possibly become mixed in with other crop material, but no evidence found to date.
704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Berg, R. Y. 2009. Embryo sac, endosperm, and seed of <i>Nemophila</i> (Boraginaceae) relative to taxonomy, with a remark on embryogeny in <i>Pholistoma</i> . <i>American Journal of Botany</i> , 96(3): 565-579	[Ant-dispersed] " <i>Nemophila</i> is characterized by two unusual features, viz. a seed cucullus, which acts as an elaiosome producing seed dispersal by ants, and seed pits, which probably facilitate water uptake and germination."

Qsn #	Question	Answer
705	Propagules water dispersed	
	Source(s)	Notes
	Cruden, R. W. 1974. The adaptive nature of seed germination in <i>Nemophila menziesii</i> Aggr. <i>Ecology</i> 55(6): 1295-1305	[Secondary dispersal by water for <i>N. menziesii</i> . Similar dispersal probably occurs for <i>N. maculata</i>] "Seed dispersal has two components: (1) dehiscence of the capsules which drops the seed onto the ground and (2) movement of the seed into or below the soil surface." ... "The typical seed probably lies on the soil surface until the heavy rains of the fall wash it into a favorable germination site."
706	Propagules bird dispersed	n
	Source(s)	Notes
	Munz, P.A. 1959. <i>A California Flora</i> . University of California Press, Berkeley and Los Angeles, CA	[Not fleshy-fruited] "caps. slightly exceeding calyx; seeds 5-12, ovoid, smooth or shallowly pitted, ca. 2 mm. long, olive; cucullus deciduous, usually papillaeform"
707	Propagules dispersed by other animals (externally)	y
	Source(s)	Notes
	Berg, R. Y. 2009. Embryo sac, endosperm, and seed of <i>Nemophila</i> (Boraginaceae) relative to taxonomy, with a remark on embryogeny in <i>Pholistoma</i> . <i>American Journal of Botany</i> , 96(3): 565-579	"In fact, all <i>Nemophila</i> species are myrmecochorous, and in all species the cucullus is the ant attractant (R. Berg, personal observation; Chung and Constance, 1992)."
	Gordon, D. R., Mitterdorfer, B., Pheloung, P. C., Ansari, S., Buddenhagen, C., Chimera, C., ... & Williams, P. A. 2010). Guidance for addressing the Australian Weed Risk Assessment questions. <i>Plant Protection Quarterly</i> , 25(2): 56-74	"This dispersal group includes seeds with an oily or fat-rich organ that aids in ant seed dispersal and seeds likely to be dispersed in animal hooves as well as on fur."
708	Propagules survive passage through the gut	
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	Unknown, but unlikely to be consumed & internally dispersed
801	Prolific seed production (>1000/m2)	
	Source(s)	Notes
	Munz, P.A. 1959. <i>A California Flora</i> . University of California Press, Berkeley and Los Angeles, CA	[Unknown, but small seeded] "seeds 5-12, ovoid, smooth or shallowly pitted, ca. 2 mm. long, olive; cucullus deciduous, usually papillaeform"
802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	American Meadows. 2014. Five Spot Seeds. http://www.americanmeadows.com/wildflower-seeds/wildflower-species/five-spot-seeds . [Accessed 17 Sep 2014]	"Is It Storable? Yes - You can store your seed in any cool (not freezing) dry place that is not subject to extreme temperature variations."

Qsn #	Question	Answer
	Royal Botanic Gardens Kew. 2008. Seed Information Database (SID). Version 7.1. http://data.kew.org/sid/ . [Accessed 17 Sep 2014]	"Storage Behaviour: No data available for species. Of 1 known taxa of genus <i>Nemophila</i> , 100.00% Orthodox(p/?)"
	Platenkamp, G. A., & Shaw, R. G. 1993. Environmental and genetic maternal effects on seed characters in <i>Nemophila menziesii</i> . <i>Evolution</i> 47(2): 540-555	[Unknown. <i>N. menziesii</i> seeds possess dormancy] "Dormancy is important in this species. In some years, almost all of the plants in our population may be prevented from flowering and setting seed due to drought (R. Shaw and L. Summers, pers. obs.). Cruden (1974) found that seeds from two northern California populations may remain dormant for at least three years under favorable conditions for germination in a growth chamber."

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 not regarded as a weed where grown.

804	Tolerates, or benefits from, mutilation, cultivation, or fire	n
	Source(s)	Notes
	FindTheBest.com, Inc. 2014. <i>Nemophila maculate</i> . http://plants.findthebest.com/l/1847/Nemophila-maculata . [Accessed 18 Sep 2014]	[An annual herb which presumably does not persist after damage or disturbance] "Fire Resistance No Resprout Ability No"
	The Royal Horticultural Society. 2014. <i>Nemophila maculate</i> - Five spot baby. https://www.rhs.org.uk/plants/details?plantid=1323 . [Accessed 17 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
- Listed as a cultivation escape
- Tolerates many soil types
- Shade tolerant
- Seeds dispersed by ants, water & intentionally by people
- Able to reach maturity in <1 year (annual)
- Seeds may possess dormancy and may form a persistent seed bank

Low Risk Traits

- No documented negative impacts to date
- If able to naturalize, may only pose a threat to higher elevation areas in the tropics
- Unarmed (no spines, thorns or burrs)
- No reports of toxicity or allergens
- Beneficial to bees and other pollinators
- Ornamental
- Not known to form dense stands
- Not known to hybridize with other *Nemophila* species
- Not reported to spread vegetatively
- Does not resprout or tolerate fire