Taxon: Nepeta cataria L. **Family:** Lamiaceae

Common Name(s): field balm
catmint
catnip
catwort

Synonym(s):

Assessor: Chuck Chimera **Status:** Assessor Approved **End Date:** 25 Jul 2016

WRA Score: 9.0 **Designation:** H(HPWRA) **Rating:** High Risk

Keywords: Perennial Herb, Weedy, Aromatic, Unpalatable, Self-Compatible

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)	Intermediate
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	n=0, y = 2*multiplier (see Appendix 2)	n
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	y=1, n=-1	y
405	Toxic to animals		
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans		
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n

Qsn #	Question	Answer Option	Answer
409	Is a shade tolerant plant at some stage of its life cycle		
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	y=1, n=-1	y
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	2
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	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)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m2)		
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides	y=-1, n=1	y
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**
	Wiersema, J.H. & León, B. 1999. World Economic Plants: A Standard Reference. CRC Press, Boca Raton, FL	[No evidence] "widely natzd. cult.: widely cult."
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	No evidence

102	Has the species become naturalized where grown?	
	Source(s)	**Notes**
	WRA Specialist. 2016. Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	**Notes**
	WRA Specialist. 2016. 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"	Intermediate
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 24 Jul 2016]	"Native: Asia-Temperate Caucasus: Armenia; Azerbaijan; Georgia; Russian Federation - Dagestan; Russian Federation-Ciscaucasia - Ciscaucasia Middle Asia: Kazakhstan; Kyrgyzstan; Tajikistan; Turkmenistan Western Asia: Afghanistan; Iran; Iraq; Lebanon; Turkey Asia-Tropical Indian Subcontinent: India; Nepal; Pakistan Europe East Europe: Moldova; Russian Federation-European part - European part; Ukraine Middle Europe: Hungary Southeastern Europe: Albania; Bulgaria; Former Yugoslavia; Greece; Italy; Romania Southwestern Europe: France; Spain"

202	Quality of climate match data	High
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 24 Jul 2016]	

Qsn #	Question	Answer
203	**Broad climate suitability (environmental versatility)**	**y**
	Source(s)	**Notes**
	Dave's Garden. 2016. Catnip. Nepeta cataria. http://davesgarden.com/guides/pf/go/79/. [Accessed 25 Jul 2016]	"Hardiness: USDA Zone 3a: to -39.9 °C (-40 °F) USDA Zone 3b: to -37.2 °C (-35 °F) USDA Zone 4a: to -34.4 °C (-30 °F) USDA Zone 4b: to -31.6 °C (-25 °F) USDA Zone 5a: to -28.8 °C (-20 °F) USDA Zone 5b: to -26.1 °C (-15 °F) USDA Zone 6a: to -23.3 °C (-10 °F) USDA Zone 6b: to -20.5 °C (-5 °F) USDA Zone 7a: to -17.7 °C (0 °F) USDA Zone 7b: to -14.9 °C (5 °F) USDA Zone 8a: to -12.2 °C (10 °F) USDA Zone 8b: to -9.4 °C (15 °F) USDA Zone 9a: to -6.6 °C (20 °F) USDA Zone 9b: to -3.8 °C (25 °F)"
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Thickets or around houses; 0-2500 m." [Elevation range exceeds 1000 m, demonstrating environmental versatility]

204	**Native or naturalized in regions with tropical or subtropical climates**	**y**
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 24 Jul 2016]	[Part of wide native range includes tropics] "Native: Asia-Tropical Indian Subcontinent: India; Nepal; Pakistan"

205	**Does the species have a history of repeated introductions outside its natural range?**	**y**
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Cultivated in Gansu, Guizhou, Henan, Hubei, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Yunnan [Afghanistan, Japan; Africa, Europe, North America]"
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 24 Jul 2016]	"Cultivated: . widely cult."

301	**Naturalized beyond native range**	**y**
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 24 Jul 2016]	"Naturalized: . widely natzd."

Qsn #	Question	Answer
	Mack, R., & Erneberg, M. (2002). The United States Naturalized Flora: Largely the Product of Deliberate Introductions. Annals of the Missouri Botanical Garden, 89(2), 176-189	"We reasoned that if a species had been used for centuries as for example a seasoning or herbal in western Europe (Sturtevant, 1919; Grieve, 1959), it was likely introduced deliberately by human immigrants to the United States (e.g. Nepeta cataria L., Dipsacusful-lonum L., Taraxacum officinale Weber)."

302	Garden/amenity/disturbance weed	y
	Source(s)	**Notes**
	The Ohio State University. 2016. Ohio Perennial and Biennial Weed Guide. http://www.oardc.ohio-state.edu/weedguide/. [Accessed 25 Jul 2016]	"In North America, it was frequently cultivated but escaped and is now found throughout northern U.S. and Canada. Catnip is widespread in Ohio. The plant grows best in rich soils, but it readily establishes in a variety of habitats. It can be found in pastures, fence rows, barnyards, stream banks, and waste places such as dumps and parking lots as well as growing along roadsides and railroads."
	Dave's Garden. 2016. Catnip. Nepeta cataria. http://davesgarden.com/guides/pf/go/79/. [Accessed 25 Jul 2016]	[Regarded as a garden weed by a number of individuals] "It is a shame we cannot totally get rid of this stuff and we never planted it to begin with. " ... "What I hadn't been aware of was it's ability to spread.... like crazy. I had little catnips popping up all over the place. It's been two years of weeding and they still come up everywhere. I never would have planted if I knew it would behave like this." ... "Maybe it is because it is growing wild around here that I do not like this plant very much. It is straggly, weedy and invasive."
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	Reported as naturalized and/or a weed from a number of sources

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	Primarily a garden & disturbance weed

304	Environmental weed	
	Source(s)	**Notes**
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	Listed as an environmental weed, but primarily naturalized or weedy in garden or disturbed habitats

Qsn #	Question	Answer
305	**Congeneric weed**	**y**
	Source(s)	**Notes**
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	Includes Nepeta amoena, Nepeta bucharica, Nepeta camphorata, Nepeta connata, Nepeta x faassenii, Nepeta grandiflora, Nepeta hederacea, Nepeta linearis, Nepeta meyeri, Nepeta mussinii, Nepeta nepetella, Nepeta nuda, Nepeta pilinux, Nepeta racemosa, Nepeta raphanorhiza, Nepeta septemcrenata, & Nepeta sibirica listed as naturalized and/or weeds

401	Produces spines, thorns or burrs	n
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	[No evidence] "Plants perennial. Stems 40-150 cm, white pubescent. Petiole 0.7-3 cm, slender; leaf blade ovate to triangular-cordate, 2.5-7 × 2.1-4.7 cm, adaxially yellow-green, hirtellous, abaxially whitish pubescent especially on veins, base cordate to truncate, margin coarsely crenate to dentate, apex obtuse to acute. Cymes axillary basally, upper ones in loose or compact, interrupted terminal panicles; bracts and bracteoles subulate, minute. Calyx tubular, ca. 6 × 1.2 mm, white pubescent; teeth hirsute inside, subulate, 1.5-2 mm, posterior teeth longer, urceolate in fruit. Corolla white with purple spots on lower lip, white villous; throat pubescent inside, ca. 7.5 mm; tube slender, ca. 0.3 mm in diam., abruptly dilated into broad throat; upper lip ca. 2 × 3 mm, apex emarginate; middle lobe of lower lip subcircular, ca. 3 × 4 mm, cordate, margin coarsely dentate. Stamens included. Nutlets nearly triquetrous, ovoid, ca. 1.7 × 1 mm."

402	Allelopathic	
	Source(s)	**Notes**
	Saharkhiz, M., Zadnour, P., & Kakouei, F. (2016). Essential oil analysis and phytotoxic activity of Catnip (Nepeta cataria L.). American Journal of Essential Oils and Natural Products, 4(1), 40-45	[Possibly Yes] "This study was conducted to assess the phytotoxic activity of essential oil (EO) from aerial parts of Catnip (Nepeta cataria L.) on some noxious weeds and field crops with a view to explore the possibility of production of natural herbicides. The EO of N. cataria was extracted by hydrodistillation and the composition of the volatile oil was characterized by GC-FID and GC-MS. The inhibitory effects of EO at concentrations of 0, 150, 300, 600, and 1200 µlL-1 on seed germination and seedling growth of Hordeum spontaneum Koch, Taraxacum officinale, Avena fatua L. and three crop seeds including Lipidium sativum, Nepeta cataria and Ocimum basilicum were tested. The examined concentrations of N. cataria EO showed different phytotoxic as well as selective properties on the germination and growth of the studied species. The studied EO could be considered as an allelochemical agent in formulation of natural herbicides in future weed control."

Qsn #	Question	Answer
	Mutlu, S., & Atici, Ö. (2009). Allelopathic effect of Nepeta meyeri Benth. extracts on seed germination and seedling growth of some crop plants. Acta Physiologiae Plantarum, 31(1), 89-93	[Unknown. Related taxa have allelopathic properties] "In order to evaluate the allelopathic potential of Nepeta meyeri Benth., the effects of aqueous extracts (0.125, 0.25, 0.5, 1, 2.5 and 5%) prepared from roots and leaves of N. meyeri were studied on the seed germination and seedling growth of several economically important crops (barley, wheat, canola, safflower, and sunflower). Both the root and leaf extracts of N. meyeri caused a general phytotoxic effect on the seed germination and seedling growth of barley and sunflower at all concentrations. However, both the root and leaf extracts significantly increased the seedling growth of wheat, especially at the lower concentrations 0.125, 0.25 and 0.5%, whereas the higher concentrations had a neutral effect. The seed germination and the seedling growth of canola and safflower were also generally improved by both extracts, especially at lower concentrations. However, these advantages were not observed at higher concentrations, at which the extracts mostly had a phytotoxic effect on canola and safflower. The Allelopathic activity of N. meyeri depended on whether the extract was derived from the leaf or root parts of the plant. The maximum allelopathic effect occurred with leaf extracts. The results demonstrate that the aqueous extracts from N. meyeri have allelopathic potential and should be evaluated as an allelopathic species, presenting a risk or advantage to seed germination and seedling growth of crop or weed plants."

403	Parasitic	n
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Subshrubs or perennial or annual herbs, usually aromatic, occasionally gynomonoecious or gynodioecious." [Generic Description. Lamiaceae. No evidence]

404	Unpalatable to grazing animals	y
	Source(s)	**Notes**
	Ries, S., Baughan, R., Nair, M. G., & Schutzki, R. (2001). Repelling animals from crops using plant extracts. HortTechnology, 11(2), 302-307	"Several plant species that are not consumed by animals were collected, extracted with organic solvents, and tested at different venues for their effectiveness as animal feeding repellents. Species with the most repellent activity were daffodil (Narcissus pseudo narcissus), bearded iris (Iris sp.), hot pepper (Capsicum frutescens), catnip (Nepeta cataria) and peppermint (Mentha piperita)." ... "...observations in the field indicate that there was no browsing on species such as daffodil, catnip, iris and the mints."
	Loewer, P. 2015. Solving Deer Problems: How to Deerproo Your Yard and Garden. Skyhorse Publishing, Inc., New York	"The odor of catnip is addictive to most cats and perhaps deer dislike the associations made if they east these plants."

405	Toxic to animals	
	Source(s)	**Notes**

Qsn #	Question	Answer
	Knight, A. 2007. A Guide to Poisonous House and Garden Plants. CRC Press, Boca Raton, FL	"Toxic Principle and Mechanism of Action The monoterpene nepetalacetone is the major component of catnip responsible for the attraction of cats. ' After inhalation and/or ingestion of the plant or catnip oil, cats may exhibit a range of pleasurable and hallucinogenic-like signs for up to 10 minutes, after which the cat loses interest in the plant and the animal returns to normal behavior.'" These pleasurable and hallucinatory responses are similar to those encountered in people smoking catnip, marijuana, and lysergic acid diethylamide (LSD.)' Similarities exist in the chemical structure of nepetalaceton, and tetrahydrocannabinol in marijuana, and LSD. Risk Assessment - There is minimal if any risk to cats eating catnip as interest in the plant is of short duration."
	The Ohio State University. 2016. Ohio Perennial and Biennial Weed Guide. http://www.oardc.ohio-state.edu/weedguide/. [Accessed 25 Jul 2016]	"Toxicity: None known."
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[Possibly toxic to cats, although contradicts other sources] "(Low toxicity; stems and leaves dangerous for cats. Tea from fresh plants to cure cold and cough. Leaves decoction given in dysentery; leaves chewed to relieve toothache. Dried leaves and flowering tops used as a stimulant, tonic, carminative, diaphoretic, and for infantile colic; hot tea alleviates menstrual cramps.)"

406	Host for recognized pests and pathogens	
	Source(s)	**Notes**
	Plants for a Future. 2016. Nepeta cataria. http://www.pfaf.org/user/Plant.aspx?LatinName=Nepeta+cataria. [Accessed 25 Jul 2016]	"It is said to repel various cabbage pests, aphis (including peach aphis), flea beetles, cucumber beetles, squash bugs and ants from plants they grow near to[238]. "
	Missouri Botanical Garden. 2016. Nepeta cataria. http://www.missouribotanicalgarden.org/. [Accessed 24 Jul 2016]	"Problems - No serious insect or disease problems."
	Smith, E. (2010). Identifying Weed Species Hosts For Onion Thrips (Thrips Tabaci Lindeman) And Their Potential As Sources Of Iris Yellow Spot Virus (Bunyaviridae: Tospovirus) In New York Onion Fields. MS Thesis. Cornell University, Ithaca, NY	"Table 2.2 Winter annual, biennial, and perennial weed species found to be reproductive hosts of T. tabaci in the Elba Muck onion growing region near Elba, New York." [Includes Nepeta cataria]

407	Causes allergies or is otherwise toxic to humans	
	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	[No evidence, but medicinal properties could result in some toxic effects to humans] "(Low toxicity; stems and leaves dangerous for cats. Tea from fresh plants to cure cold and cough. Leaves decoction given in dysentery; leaves chewed to relieve toothache. Dried leaves and flowering tops used as a stimulant, tonic, carminative, diaphoretic, and for infantile colic; hot tea alleviates menstrual cramps.)"

408	Creates a fire hazard in natural ecosystems	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	DiTomaso, J. 2007. Weeds of California and Other Western States, Volume 2. UCANR Publications, Oakland, CA	[No evidence. Unlikely given habitat] "Perennial; garden escape; moist, typically shaded areas"

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	**Notes**
	DiTomaso, J. 2007. Weeds of California and Other Western States, Volume 2. UCANR Publications, Oakland, CA	"Perennial; garden escape; moist, typically shaded areas"
	Webb, C. J., Sykes, W. R., & Garnock-Jones, P. J. 1988. Flora of New Zealand Volume IV. Botany Division, DSIR, Christchurch, New Zealand	"Rather shady places in and around forest remnants, scrub and plantations."
	Dave's Garden. 2016. Catnip. Nepeta cataria. http://davesgarden.com/guides/pf/go/79/. [Accessed 25 Jul 2016]	"Sun Exposure: Full Sun Sun to Partial Shade"

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	**Notes**
	Plants for a Future. 2016. Nepeta cataria. http://www.pfaf.org/user/Plant.aspx?LatinName=Nepeta+cataria. [Accessed 25 Jul 2016]	"Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: acid, neutral and basic (alkaline) soils and can grow in very alkaline soils."
	The Ohio State University. 2016. Ohio Perennial and Biennial Weed Guide. http://www.oardc.ohio-state.edu/weedguide/. [Accessed 25 Jul 2016]	"The plant grows best in rich soils, but it readily establishes in a variety of habitats."

411	Climbing or smothering growth habit	n
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Plants perennial. Stems 40-150 cm, white pubescent. Petiole 0.7-3 cm, slender; leaf blade ovate to triangular-cordate, 2.5-7 × 2.1-4.7 cm, adaxially yellow-green, hirtellous, abaxially whitish pubescent especially on veins, base cordate to truncate, margin coarsely crenate to dentate, apex obtuse to acute. "

412	Forms dense thickets	
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Thickets or around houses; 0-2500 m." [Unknown if it forms thickets in China or is merely a component of thicket vegetation]

Qsn #	Question	Answer
501	**Aquatic**	**n**
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	[Terrestrial herb] "Plants perennial." ... "Thickets or around houses; 0 -2500 m."

502	**Grass**	**n**
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 24 Jul 2016]	"Family: Lamiaceae (alt.Labiatae) Subfamily: Nepetoideae Tribe: Mentheae"

503	**Nitrogen fixing woody plant**	**n**
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 24 Jul 2016]	"Family: Lamiaceae (alt.Labiatae) Subfamily: Nepetoideae Tribe: Mentheae"

504	**Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)**	**n**
	Source(s)	**Notes**
	The Ohio State University. 2016. Ohio Perennial and Biennial Weed Guide. http://www.oardc.ohio-state.edu/weedguide/. [Accessed 25 Jul 2016]	"The root system forms a taproot and eventually short rhizomes (horizontal underground stems)."

601	**Evidence of substantial reproductive failure in native habitat**	**n**
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 25 Jul 2016]	No evidence. Widespread native & introduced range

602	**Produces viable seed**	**y**
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Nutlets nearly triquetrous, ovoid, ca. 1.7 × 1 mm."
	The Ohio State University. 2016. Ohio Perennial and Biennial Weed Guide. http://www.oardc.ohio-state.edu/weedguide/. [Accessed 25 Jul 2016]	"This species reproduces by seeds and it also produces short rhizomes (horizontal underground stems)."

Qsn #	Question	Answer
603	**Hybridizes naturally**	
	Source(s)	**Notes**
	Radulović, N., Blagojević, P. D., Rabbitt, K., & Menezes, F. S. (2011). Essential oil of Nepeta x faassenii Bergmans ex Stearn (N. mussinii Spreng. x N. nepetella L.): a comparison study. Natural Product Communications, 6(7), 1015-1022	Unknown for N. cataria. Hybridization reported in genus

604	**Self-compatible or apomictic**	**y**
	Source(s)	**Notes**
	Ghazoul, J. (2005). Pollen and seed dispersal among dispersed plants. Biological Reviews, 80(03), 413-443	"Table 1. A summary of impacts of population size, density, purity and patch size (fragmentation) on plant reproductive ecology." [Nepeta cataria - BS refers to breeding system as self-compatible (C)]

605	**Requires specialist pollinators**	**n**
	Source(s)	**Notes**
	Ghazoul, J. (2005). Pollen and seed dispersal among dispersed plants. Biological Reviews, 80(03), 413-443	"Table 1. A summary of impacts of population size, density, purity and patch size (fragmentation) on plant reproductive ecology." [Nepeta cataria - Pollinator = Bees]

606	**Reproduction by vegetative fragmentation**	**y**
	Source(s)	**Notes**
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"It is usually grown from seed but can also be propagated by division of the prostrate rooted stems."
	The Ohio State University. 2016. Ohio Perennial and Biennial Weed Guide. http://www.oardc.ohio-state.edu/weedguide/. [Accessed 25 Jul 2016]	"This species reproduces by seeds and it also produces short rhizomes (horizontal underground stems)."

607	**Minimum generative time (years)**	**2**
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Plants perennial."
	Wyevale Garden Centres. 2016. Nepeta cataria Catmint. http://www.wyevalegardencentres.co.uk/item/Flower-Seeds/Catmint/43. [Accessed 25 Jul 2016]	"Time to maturity: 2 - 5 years"

701	**Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)**	**y**
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Nutlets nearly triquetrous, ovoid, ca. 1.7 × 1 mm." [Nutlets lack means of external attachment, but are small enough to be easily transported in soil adhering to foot ware, machinery or vehicles]

Qsn #	Question	Answer
	The Ohio State University. 2016. Ohio Perennial and Biennial Weed Guide. http://www.oardc.ohio-state.edu/weedguide/. [Accessed 25 Jul 2016]	[Probably Yes. Frequent along heavily-trafficked areas such as roadsides & railroads] "The plant grows best in rich soils, but it readily establishes in a variety of habitats. It can be found in pastures, fence rows, barnyards, stream banks, and waste places such as dumps and parking lots as well as growing along roadsides and railroads."

702	Propagules dispersed intentionally by people	y
	Source(s)	**Notes**
	Mack, R., & Erneberg, M. (2002). The United States Naturalized Flora: Largely the Product of Deliberate Introductions. Annals of the Missouri Botanical Garden, 89(2), 176-189	"Table 2. Naturalized species in the United States considered by de Schweinitz (1832) to have been deliberately introduced." [Includes Nepeta cataria]

703	Propagules likely to disperse as a produce contaminant	y
	Source(s)	**Notes**
	Mack, R., & Erneberg, M. (2002). The United States Naturalized Flora: Largely the Product of Deliberate Introductions. Annals of the Missouri Botanical Garden, 89(2), 176-189	"Table 4. Non-indigenous species detected repeatedly as seed contaminants in domestic and imported crop seeds in the late l9th century (Chester, 1889)." [Includes Nepeta cataria]

704	Propagules adapted to wind dispersal	n
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Nutlets nearly triquetrous, ovoid, ca. 1.7 × 1 mm." [Small size, but no physical adaptations for wind dispersal]

705	Propagules water dispersed	
	Source(s)	**Notes**
	The Ohio State University. 2016. Ohio Perennial and Biennial Weed Guide. http://www.oardc.ohio-state.edu/weedguide/. [Accessed 25 Jul 2016]	[Distribution along stream banks suggests possibly movement by water] "It can be found in pastures, fence rows, barnyards, stream banks, and waste places such as dumps and parking lots as well as growing along roadsides and railroads."

706	Propagules bird dispersed	n
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Nutlets nearly triquetrous, ovoid, ca. 1.7 × 1 mm." [No evidence]

Qsn #	Question	Answer
707	**Propagules dispersed by other animals (externally)**	**n**
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Nutlets nearly triquetrous, ovoid, ca. 1.7 × 1 mm." [No means of external attachment, although small size may allow for adherence to animals in soil or hair]

708	**Propagules survive passage through the gut**	**y**
	Source(s)	**Notes**
	Cox, D. D. 2005. A Naturalist's Guide to Field Plants: An Ecology for Eastern North America. Syracuse University Press, Syracuse, NY	"Sometimes seeds pass through the digestive tracts of browsing or grazing animals. Such passage, whether in grazers or fruit eaters, often improves the likelihood of germination by softening hard seed coats. Hay containing many open field weeds was fed to horses, cows, swine, and sheep, and the following are a few species whose seeds were still able to germinate after passage through these animals: catnip (Nepeta cataria) ,...
	Williams, S. C., Ward, J. S., & Ramakrishnan, U. (2008). Endozoochory by white-tailed deer (Odocoileus virginianus) across a suburban/woodland interface. Forest Ecology and Management, 255(3), 940-947	"Table 1 Total number of seedlings (density) and number of pellet group occurrences (occurrence) for germinated seeds" [Nepeta cataria seeds germinated from deer pellets]

801	**Prolific seed production (>1000/m2)**	
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Nutlets nearly triquetrous, ovoid, ca. 1.7 × 1 mm." [Small seeds. Densities unknown]
	Rosburg, T. R., Jurik, T. W., & Glenn-Lewin, D. C. (1994). Seed banks of communities in the Iowa Loess Hills: ecology and potential contribution to restoration of native grassland. In Proceedings of the 13th North American Prairie Conference: Spirit of the Land, Our Prairie Legacy. Windsor, ON, Canada: Department of Parks and Recreation, Windsor, ON, Canada (pp. 221-237)	"Table 1. Occurrence of species in seed bank samples at site 1." [Nepeta cataria seeds recorded at densities of 120 seeds/m2]

802	**Evidence that a persistent propagule bank is formed (>1 yr)**	
	Source(s)	**Notes**
	Royal Botanic Gardens Kew. (2016) Seed Information Database (SID). Version 7.1. http://data.kew.org/sid/. [Accessed 25 Jul 2016]	[Possibly Yes. Longevity in natural conditions unknown] "Storage Behaviour: Orthodox. Storage Conditions: 4% germination following 15 years storage at room temperature (Harrington, 1972)"

803	**Well controlled by herbicides**	**y**
	Source(s)	**Notes**

Qsn #	Question	Answer
	U.S. Department of the Interior Bureau of Land Management. 1985. Northwest Area Noxious Weed Control Program Environmental mpact Statement. Oregon State Office Bureau of Land Management, Portland, Oregon	"Appendix E Susceptibility of Common Weeds to Control by 2,4-D, Dicamba, Picloram, and Glyphosate Herbicides" ... "The table in Appendix E lists the effects of phenoxy and some other systemic herbicides when applied as sprays on the foliage of many common weeds. These comparisons are based on an application rate of 1 pound active equivalent per acre for 2,4-D, dicamba, and picloram and 1.5 pounds active ingredient per acre for glyphosate." [Catnip (Nepeta cataria). Dicamba & Picloram give excellent control. Excellent (E). Over 95 percent of the weed population is killed by a single treatment. Plant is highly susceptible to the chemical. 2,4-D & Glyphosate give good control. Good (G). One treatment per year maintains 85 to 94 percent suppression of top growth, or more than 95 percent of the weed population is killed by two or three treatments. Plant is susceptible to the chemical.]

804	**Tolerates, or benefits from, mutilation, cultivation, or fire**	**n**
	Source(s)	**Notes**
	The Ohio State University. 2016. Ohio Perennial and Biennial Weed Guide. http://www.oardc.ohio-state.edu/weedguide/. [Accessed 25 Jul 2016]	"The plant can be controlled using clean cultivation. In areas where cultivation or hoeing is not possible, repeated mowing can be used to control the weed. Mowing should begin in the spring and be repeated often enough to prevent shoot growth."

805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	
	Source(s)	**Notes**
	WRA Specialist. 2016. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits
• Elevation range exceeds 1000 m, demonstrating environmental versatility
• Can grow in tropical climates
• Widely naturalized (but no evidence in Hawaiian Islands]
• Weedy in gardens and disturbed habitats
• Other Nepeta species are invasive
• Potentially allelopathic
• Unpalatable to browsing animals
• Tolerates many soil types
• Reproduces by seeds & vegetatively
• Self-compatible
• Small seeds dispersed inadvertently as a contaminant, & along heavily trafficked areas; also intentionally cultivated
• Seeds able to be stored for extended periods; May form a persistent seed bank

Low Risk Traits
• Unarmed (no spines, thorns or burrs)
• Cultivated intentionally for medicinal effects on cats
• Herbicides & mowing may provide effective control