

Australia/New Zealand Weed Risk Assessment adapted for United States.

Data used for analysis published in: Gordon, D.R. and C.A. Gantz. 2008. Potential impacts on the horticultural industry of screening new plants for invasiveness. Conservation Letters 1: 227-235. Available at: <http://www3.interscience.wiley.com/cgi-bin/fulltext/121448369/PDFSTART>

<i>Dianthus cretaceus</i>			
Question number	Question	Answer	Score
1.01	Is the species highly domesticated?	n	0
1.02	Has the species become naturalised where grown?		
1.03	Does the species have weedy races?		
2.01	Species suited to U.S. climates (USDA hardiness zones; 0-low, 1-intermediate, 2-high)	2	
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high)	2	
2.03	Broad climate suitability (environmental versatility)	y	1
2.04	Native or naturalized in regions with an average of 11-60 inches of annual precipitation	y	1
2.05	Does the species have a history of repeated introductions outside its natural range?	?	
3.01	Naturalized beyond native range	n	-1
3.02	Garden/amenity/disturbance weed	n	0
3.03	Weed of agriculture	n	0
3.04	Environmental weed	n	0
3.05	Congeneric weed	n	0
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic		
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals		
4.05	Toxic to animals	n	0
4.06	Host for recognised pests and pathogens		
4.07	Causes allergies or is otherwise toxic to humans	n	0
4.08	Creates a fire hazard in natural ecosystems		
4.09	Is a shade tolerant plant at some stage of its life cycle		
4.1	Grows on one or more of the following soil types: alfisols, entisols, or mollisols	y	1
4.11	Climbing or smothering growth habit	n	0
4.12	Forms dense thickets	n	0

5.01	Aquatic	n	0
5.02	Grass	n	0
5.03	Nitrogen fixing woody plant	n	0
5.04	Geophyte		
6.01	Evidence of substantial reproductive failure in native habitat	n	0
6.02	Produces viable seed		
6.03	Hybridizes naturally	y	1
6.04	Self-compatible or apomictic		
6.05	Requires specialist pollinators		
6.06	Reproduction by vegetative fragmentation		
6.07	Minimum generative time (years)		
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
7.02	Propagules dispersed intentionally by people	n	-1
7.03	Propagules likely to disperse as a produce contaminant	n	-1
7.04	Propagules adapted to wind dispersal	n	-1
7.05	Propagules water dispersed		
7.06	Propagules bird dispersed		
7.07	Propagules dispersed by other animals (externally)	n	-1
7.08	Propagules dispersed by other animals (internally)		
8.01	Prolific seed production		
8.02	Evidence that a persistent propagule bank is formed (>1 yr)		
8.03	Well controlled by herbicides		
8.04	Tolerates, or benefits from, mutilation or cultivation		
8.05	Effective natural enemies present in U.S.		
Total Score			-1

Outcome	Accept
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section	# questions answered	satisfy minimum?
A	10	Yes
B	7	Yes
C	9	Yes
total	26	yes

Data collected 2008

Question number	Reference	Source data
1.01		used horticulturally, but no evidence of significant modification
1.02		
1.03		
2.01	<p>1. PERAL NAPPFAST Global Plant Hardiness (http://www.nappfast.org/Plant_hardiness/NAPPFAST%20Global%20zones/10-year%20climate/PLANT_HARDINESS_10YR%20lgn d.tif). 2. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?434697). 3. Assadi, M (1985) The genus <i>Dianthus</i> L. (Caryophyllaceae) in Iran. Iranian Journal of Botany 3(1): 11-54. 4. Shishkin, BK (1936) Flora of the U.S.S.R. Volume VI. Centrospermae. P. 642. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970). 5. Davis, PH (Editor) (1969) Flora of Turkey and the East Aegean Islands. Volume 2. P. 113. Edinburgh at the University Press, Edinburgh.</p>	<p>1. Global hardiness zones 5-10 (and possibly hardiness zone 4). 2. Western Asia: Iran [n.]; Turkey - Kars; Caucasus: Azerbaijan 3. "Distribution Caucasia, Turkey, Iran". 4. "Caucasus: Gr. Cauc., E., W., and S. Transc. Gen. distr.: As. Min., Arm. - Kurd." 5. "Georgia"; "Kars: nr. Kars"; "Caucasia, N. Iran. The Turkish record needs confirmation."</p>
2.02		
2.03	<p>1. Köppen-Geiger climate map (http://www.hydrol-earth-syst-sci.net/11/1633/2007/hess-11-1633-2007.pdf). 2. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?434697). 3. Assadi, M (1985) The genus <i>Dianthus</i> L. (Caryophyllaceae) in Iran. Iranian Journal of Botany 3(1): 11-54. 4. Shishkin, BK (1936) Flora of the U.S.S.R. Volume VI. Centrospermae. P. 642. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970). 5. Davis, PH (Editor) (1969) Flora of Turkey and the East Aegean Islands. Volume 2. P. 113. Edinburgh at the University Press, Edinburgh.</p>	<p>1. Three climatic regions. 2. Western Asia: Iran [n.]; Turkey - Kars; Caucasus: Azerbaijan 3. "Distribution Caucasia, Turkey, Iran" [3 biomes] 4. "Caucasus: Gr. Cauc., E., W., and S. Transc. Gen. distr.: As. Min., Arm. - Kurd." 5. "Georgia"; "Kars: nr. Kars"; "Caucasia, N. Iran. The Turkish record needs confirmation."</p>
2.04	<p>1. Microsoft Encarta World Precipitation and Average Rainfall (http://uk.encarta.msn.com/encnet/RefPages/RefMed</p>	<p>1. For Iran, average annual precipitation ranges from less than 10 inches/year to 20 inches/year;</p>

	ia.aspx?refid=461530746&artrefid=761554737&pn=3&sec=-1). 2. Atlapedia Online (http://www.atlapedia.com/online/countries/azerbaij.htm).	For Turkey, average annual precipitation ranges from less than 10 inches/year to 40 inches/year. 2. For Azerbaijan: average annual precipitation is between 200 to 300 mm (8 to 12 inches) in the lowlands and 300 to 900 mm (12 to 35.5 inches) in the highlands, although precipitation is distributed unevenly throughout the year.
2.05		no evidence
3.01		no evidence
3.02		no evidence
3.03		no evidence
3.04		no evidence
3.05	1. Holm, L, JV Pancho, JP Herberger, and DL Plucknett (1979) A Geographical Atlas of World Weeds. John Wiley and Sons, New York. 2. New Zealand Plant Conservation Network (2005) New Zealand Adventive Vascular Plant List.	1. Holm lists four congeners: one is a common weed in Hawaii and present as a weed in the USA, and the other two are present as weeds in Turkey and Chile, respectively. 2. There are 4 "fully naturalised" congeners and 1 congener with a "casual observation" in New Zealand. [not enough evidence to be considered weeds]
4.01	Assadi, M (1985) The genus <i>Dianthus</i> L. (Caryophyllaceae) in Iran. Iranian Journal of Botany 3(1): 11-54.	no description of these traits
4.02		
4.03	Assadi, M (1985) The genus <i>Dianthus</i> L. (Caryophyllaceae) in Iran. Iranian Journal of Botany 3(1): 11-54.	no description of parasitism
4.04		
4.05	Assadi, M (1985) The genus <i>Dianthus</i> L. (Caryophyllaceae) in Iran. Iranian Journal of Botany 3(1): 11-54.	no evidence
4.06		
4.07	Assadi, M (1985) The genus <i>Dianthus</i> L. (Caryophyllaceae) in Iran. Iranian Journal of Botany 3(1): 11-54.	no evidence

4.08		
4.09		
4.1	USDA, National Resources Conservation Services (NRCS), Soil Survey Division, World Soil Resources (http://soils.usda.gov/use/worldsoils/mapindex/order.html).	Entisols and mollisols are present in these regions.
4.11	1. Assadi, M (1985) The genus <i>Dianthus</i> L. (Caryophyllaceae) in Iran. Iranian Journal of Botany 3(1): 11-54. 2. Shishkin, BK (1936) Flora of the U.S.S.R. Volume VI. Centrospermae. P. 642. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970). 3. Walters, SM <i>et al</i> (1984) The European Garden Flora. Volume III. Dicotyledons (Part I). P. 183. Cambridge University Press, Cambridge (Cambridgeshire) and New York. 4. Davis, PH (Editor) (1969) Flora of Turkey and the East Aegean Islands. Volume 2. P. 113. Edinburgh at the University Press, Edinburgh.	1. "Many-stemmed from base...stems simple". 2. "Perennial; stems numerous, 20-40 cm long, simple or rarely branched". 3. "Herbs, often hairless and with more or less woody stocks; rarely small shrubs" [genus description]. 4. "Like <i>D. multicaulis</i> but plant more robust"; "tufted perennial, 12-18 cm." [description of <i>D. multicaulis</i>].
4.12	1. Assadi, M (1985) The genus <i>Dianthus</i> L. (Caryophyllaceae) in Iran. Iranian Journal of Botany 3(1): 11-54. 2. Shishkin, BK (1936) Flora of the U.S.S.R. Volume VI. Centrospermae. P. 642. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970). 3. Walters, SM <i>et al</i> (1984) The European Garden Flora. Volume III. Dicotyledons (Part I). P. 183. Cambridge University Press, Cambridge (Cambridgeshire) and New York. 4. Davis, PH (Editor) (1969) Flora of Turkey and the East Aegean Islands. Volume 2. P. 113. Edinburgh at the University Press, Edinburgh.	1. "Many-stemmed from base...stems simple". 2. "Perennial; stems numerous, 20-40 cm long, simple or rarely branched". 3. "Herbs, often hairless and with more or less woody stocks; rarely small shrubs" [genus description]. 4. "Like <i>D. multicaulis</i> but plant more robust"; "tufted perennial, 12-18 cm." [description of <i>D. multicaulis</i>].
5.01		terrestrial
5.02		Caryophyllaceae
5.03		Caryophyllaceae
5.04		
6.01		no evidence
6.02		
6.03	Dalci, M (1986) A phyletic arrangement of the East Anatolian <i>Dianthus</i> L. species based on the inflorescence and collar reduction. Turkish Journal of Biology 10(1): 61-70.	"Field observations have revealed the presence of hybridization between... <i>D. liboschitzianus</i> - <i>D. cretaceus</i> ... <i>D. cretaceus</i> - <i>D. crinitus</i> ...but without experimental

		evidences, these possibilities cannot be used for a phyletic arrangement."
6.04		
6.05		
6.06		
6.07		
7.01		
7.02		no evidence
7.03		no evidence
7.04	1. Walters, SM et al (1984) The European Garden Flora. Volume III. Dicotyledons (Part I). P. 183. Cambridge University Press, Cambridge (Cambridgeshire) and New York. 2. Davis, PH (Editor) (1969) Flora of Turkey and the East Aegean Islands. Volume 2. P. 113. Edinburgh at the University Press, Edinburgh.	1. "Fruit a capsule opening apically with 4 teeth"; "seeds numerous, concave on 1 side." [genus description]. 2. "Capsule dehiscing by 4 teeth. Seeds peltate, with facial hilum." [genus description]. [no evidence of adaptations to wind dispersal].
7.05		
7.06		
7.07	1. Walters, SM et al (1984) The European Garden Flora. Volume III. Dicotyledons (Part I). P. 183. Cambridge University Press, Cambridge (Cambridgeshire) and New York. 2. Davis, PH (Editor) (1969) Flora of Turkey and the East Aegean Islands. Volume 2. P. 113. Edinburgh at the University Press, Edinburgh.	1. "Fruit a capsule opening apically with 4 teeth"; "seeds numerous, concave on 1 side." [genus description]. 2. "Capsule dehiscing by 4 teeth. Seeds peltate, with facial hilum." [genus description]. [no evidence of adaptations to external dispersal].
7.08		
8.01		
8.02		
8.03		
8.04		
8.05		