

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>Pulsatilla violacea</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)	1	
2.03	Broad climate suitability (environmental versatility)	n	0
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?	y	
3.01	Naturalized beyond native range	n	-2
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	?	
4.08	Creates a fire hazard in natural ecosystems		
4.09	Is a shade tolerant plant at some stage of its life cycle	n	0
4.1	Grows on one or more of the following soil types: alfisols, entisols, or mollisols	?	
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	y	1
6.03	Hybridizes naturally		
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	y	1
7.03	Propagules likely to disperse as a produce contaminant	n	-1
7.04	Propagules adapted to wind dispersal	?	
7.05	Propagules water dispersed		
7.06	Propagules bird dispersed		
7.07	Propagules dispersed by other animals (externally)	?	
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			0

Outcome	Accept
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section	# questions answered	satisfy minimum?
A	11	Yes
B	6	Yes
C	7	Yes
total	24	yes

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%20gnd.tif). 2. Czerepanov, SK (1995) Vascular Plants of Russia and Adjacent States (the former USSR). Cambridge University Press, Cambridge and New York. 3. Slabý, P. (2007) Rock Garden Plant Database (http://www.kadel.cz/flora/g/kvCard.asp-Id=14290.htm). 4. Kikvidze, Z (1996) Neighbour interaction and stability in subalpine meadow communities. <i>Journal of Vegetation Science</i> 7: 41-44. 5. Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Ranales and Rhoadales. Pp. 221-223, 236. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970).</p>	<p>1. Global plant hardiness zones 4-8. 2. Caucasus 3. Caucasus: N. Caucasus, Transcaucasus. 4. "Experiments were carried out in the subalpine belt of the Kazbegi District in the Central Caucasus (42°48'N, 44°39'E), in the valley of the River Tergi (Terek)." [North Georgia]. 5. "Caucasus: Cisc., Dag., E. and S. Transc. (Main Range and Lesser Caucasus)".</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. Czerepanov, SK (1995) Vascular Plants of Russia and Adjacent States (the former USSR). Cambridge University Press, Cambridge and New York. 3. Slabý, P. (2007) Rock Garden Plant Database (http://www.kadel.cz/flora/g/kvCard.asp-Id=14290.htm). 4. Kikvidze, Z (1996) Neighbour interaction and stability in subalpine meadow communities. <i>Journal of Vegetation Science</i> 7: 41-44. 5. Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Ranales and Rhoadales. Pp. 221-223, 236. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970).</p>	<p>1. Only two climatic regions. 2. Caucasus 3. Caucasus: N. Caucasus, Transcaucasus. 4. "Experiments were carried out in the subalpine belt of the Kazbegi District in the Central Caucasus (42°48'N, 44°39'E), in the valley of the River Tergi (Terek)". 5. "Caucasus: Cisc., Dag., E. and S. Transc. (Main Range and Lesser Caucasus)".</p>
2.04	<p>Kikvidze, Z (1996) Neighbour interaction and stability in subalpine meadow communities. <i>Journal of Vegetation Science</i> 7: 41-44.</p>	<p>"Experiments were carried out in the subalpine belt of the Kazbegi District in the Central Caucasus (42°48'N, 44°39'E), in the valley of the River Tergi (Terek)."; "The average annual</p>

		precipitation is ca. 800 mm" [31.5 in]
2.05	Slabý, P. (2007) Rock Garden Plant Database (http://www.kadel.cz/flora/g/kvCard.asp-Id=14290.htm).	Information provided on a Czech rock garden database: "Cultivation...alpine house".
3.01		no evidence
3.02		no evidence
3.03		no evidence
3.04		no evidence
3.05		no evidence
4.01	Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Ranales and Rhoadales. Pp. 221-223, 236. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970).	no description of these traits
4.02		
4.03	Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Ranales and Rhoadales. Pp. 221-223, 236. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970).	no description of parasitism
4.04	Kikvidze, Z (1996) Neighbour interaction and stability in subalpine meadow communities. Journal of Vegetation Science 7: 41-44.	"Overgrazed pasture dominated by <i>Pulsatilla violacea</i> ...the canopy of the <i>Pulsatilletum</i> is open because of intensive grazing by sheep (cover 80%, height ca. 20cm)."
4.05	Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Ranales and Rhoadales. Pp. 221-223, 236. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970).	no evidence
4.06		
4.07	Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Ranales and Rhoadales. Pp. 221-223, 236. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970).	"These poisonous and medicinal plants contain the alkaloid anemonin, which has an irritating effect on the skin (similar to that produced by the Spanish fly). The plants are widely used in homeopathy." [genus description].
4.08		

4.09	1. Slabý, P. (2007) Rock Garden Plant Database (http://www.kadel.cz/flora/g/kvCard.asp-Id=14290.htm). 2. Walters, SM et al (1984) The European Garden Flora. Volume III. Dicotyledons (Part I). P. 355. Cambridge University Press, Cambridge (Cambridgeshire) and New York.	1. "Cultivation: sunny...sun". 2. "All the species in cultivation are...not difficult to grow in sunny, open, well-drained sites" [genus description].
4.1	1. USDA, National Resources Conservation Services (NRCS), Soil Survey Division, World Soil Resources (http://soils.usda.gov/use/worldsoils/mapindex/order.html). 2. Slabý, P. (2007) Rock Garden Plant Database (http://www.kadel.cz/flora/g/kvCard.asp-Id=14290.htm). 3. Walters, SM et al (1984) The European Garden Flora. Volume III. Dicotyledons (Part I). P. 355. Cambridge University Press, Cambridge (Cambridgeshire) and New York.	1. Mollisols and alfisols occur in the region of origin, but since it is not well-defined, there are potentially large regions of the "rocky land" soil order type which may accommodate the species. 2. "dry, rocky crevices...poor, drained soil". 3. "Many preferring alkaline conditions but thriving also in acid soils" [genus description].
4.11	1. Slabý, P. (2007) Rock Garden Plant Database (http://www.kadel.cz/flora/g/kvCard.asp-Id=14290.htm). 2. Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Ranales and Rhoadales. Pp. 221-223, 236. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970).	1. "Size: 5-20 cm"; "Type: tuft". 2. "Perennial...Other characters as in <i>P. albana</i> "; "Perennial, 5-18 cm, in fruit to 30 cm high" [description of <i>P. albana</i>] [species description]; "Perennial herbaceous plants with a more or less long subterranean rootstock and a rosette of radical leaves" [genus description].
4.12	1. Slabý, P. (2007) Rock Garden Plant Database (http://www.kadel.cz/flora/g/kvCard.asp-Id=14290.htm). 2. Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Ranales and Rhoadales. Pp. 221-223, 236. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970).	1. "Size: 5-20 cm"; "Type: tuft". 2. "Perennial...Other characters as in <i>P. albana</i> "; "Perennial, 5-18 cm, in fruit to 30 cm high" [description of <i>P. albana</i>] [species description]; "Perennial herbaceous plants with a more or less long subterranean rootstock and a rosette of radical leaves" [genus description].
5.01		terrestrial
5.02		Ranunculaceae
5.03		Ranunculaceae
5.04	Walters, SM <i>et al</i> (1984) The European Garden Flora. Volume III. Dicotyledons (Part I). P. 355. Cambridge University Press, Cambridge (Cambridgeshire) and New York.	"Tufted, perennial herbs with woody, fibrous rootstocks" [genus description].

6.01		no evidence
6.02	1. Slabý, P. (2007) Rock Garden Plant Database (http://www.kadel.cz/flora/g/kvCard.asp-Id=14290.htm). 2. Walters, SM et al (1984) The European Garden Flora. Volume III. Dicotyledons (Part I). P. 355. Cambridge University Press, Cambridge (Cambridgeshire) and New York.	1. "Propagation: seed in winter". 2. "Propagation is normally from seed" [genus description].
6.03		
6.04		
6.05		
6.06		
6.07		
7.01		
7.02	Slabý, P. (2007) Rock Garden Plant Database (http://www.kadel.cz/flora/g/kvCard.asp-Id=14290.htm).	Information provided on a Czech rock garden database: "Cultivation...alpine house".
7.03		no evidence
7.04	Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Ranales and Rhoadales. Pp. 221-223, 236. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970).	"Fruitlets with short stout awns 2-2.5 cm long" [description of <i>P. albana</i> which is described as being similar to <i>P. violacea</i>] [species description]; "Fruitlets oblong, pilose, persistent, awnlike, plumose style [much] enlarged, many times as long as the fruitlet" [genus description].
7.05		
7.06		
7.07	Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Ranales and Rhoadales. Pp. 221-223, 236. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970).	"Fruitlets with short stout awns 2-2.5 cm long" [description of <i>P. albana</i> which is described as being similar to <i>P. violacea</i>] [species description]; "Fruitlets oblong, pilose, persistent, awnlike, plumose style [much] enlarged, many times as long as the fruitlet" [genus description]. [no description of adaptations to external dispersal]
7.08		
8.01		
8.02		
8.03		
8.04		
8.05		