

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>Scilla rosenii</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)	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	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	?	
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	y	1
5.04	Geophyte	n	0
6.01	Evidence of substantial reproductive failure in native habitat	y	1
6.02	Produces viable seed	?	
6.03	Hybridizes naturally		
6.04	Self-compatible or apomictic		
6.05	Requires specialist pollinators	y	1
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)	y	1
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		
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.	n	0
Total Score			1

Outcome	Accept*
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*Used secondary screen from: Daehler, C. C., J.L. Denslow, S. Ansari, and H. Kuo. 2004. A risk assessment system for screening out harmful invasive pest plants from Hawaii's and other Pacific islands. *Conserv. Biol.* 18: 360-368.

section	# questions answered	satisfy minimum?
A	11	Yes
B	6	Yes
C	10	Yes
total	27	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%20gnd.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?33346). 3. Shulkina, T. 2004. Ornamental Plants from Russia and Adjacent States of the Former Soviet Union. Rostok, St. Petersburg, Russia. [in English]. http://www.efloras.org/florataxon.aspx?flora_id=120&taxon_id=242442591. Accessed March, 2008. 4. Baranova, MV (1992) New Endemic Bulbous Plants of the St. Petersburg Botanical Garden. Acta Horticulturae 325: 847-848. www.actahort.org/books/325/325_124.htm. Abstract accessed online March, 2008. 5. www.rareplants.de (http://www.rareplants.de/shop/uploads/Html/Scilliarosenii-_6966_1.htm). 6. Czerepanov, SK (1995) Vascular Plants of Russia and Adjacent States (the former USSR). Cambridge University Press, Cambridge and New York. 7. Walters, SM et al (1984) The European Garden Flora. Volume I. Pteridophyta, Gymnospermae, Angiospermae-Monocotyledons (Part I). Cambridge University Press, Cambridge (Cambridgeshire) and New York. 8. Komarov, VL (1935) Flora of the U.S.S.R.</p>	<p>1. Global plant hardiness zones 4-8. 2. Western Asia: Turkey [n.e.]; Caucasus: Armenia; Georgia. 3. "Z 4"; "Caucasus (western Transcaucasus and northeastern Turkey." 4. "The natural habitat of <i>S. rosenii</i> is the mountain meadows of the Caucasus." 5. "Native of Armenia, Georgia and NE Turkey" 6. Caucasus. 7. "USSR (Caucasus)". 8. "Caucasus: W. and S. Transc. Gen. distr.: Bal.-As. Min. (Asia Minor), Arm.-Kurd". 9. "Georgia, Soviet Armenia. Ir.-Tur. element."</p>

	Volume IV. Liliiflorae and Microspermae. Pp. 283-288. 9. Davis, PH (1984) Flora of Turkey and the East Aegean Islands. Volume 8. Pp. 219-220. Edinburgh University Press, Edinburgh.	
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?33346). 3. Shulkina, T. 2004. Ornamental Plants from Russia and Adjacent States of the Former Soviet Union. Rostok, St. Petersburg, Russia. [in English]. http://www.efloras.org/florataxon.aspx?flora_id=120&taxon_id=242442591. Accessed March, 2008. 4. Baranova, MV (1992) New Endemic Bulbous Plants of the St. Petersburg Botanical Garden. Acta Horticulturae 325: 847-848. www.actahort.org/books/325/325_124.htm. Abstract accessed online March, 2008. 5. www.rareplants.de (http://www.rareplants.de/shop/uploads/Html/Scillarosenii-_6966_1.htm). 6. Czerepanov, SK (1995) Vascular Plants of Russia and Adjacent States (the former USSR). Cambridge University Press, Cambridge and New York. 7. Walters, SM et al (1984) The European Garden Flora. Volume I. Pteridophyta, Gymnospermae, Angiospermae-Monocotyledons (Part I). Cambridge University Press, Cambridge (Cambridgeshire) and New York. 8. Komarov, VL (1935) Flora of the U.S.S.R. Volume IV. Liliiflorae and Microspermae. Pp. 283-288. 9. Davis, PH (1984) Flora of Turkey and the East Aegean Islands. Volume 8. Pp. 219-220. Edinburgh University Press, Edinburgh.</p>	<p>1. Only two climatic regions. 2. Western Asia: Turkey [n.e.]; Caucasus: Armenia; Georgia. 3. "Z 4"; "Caucasus (western Transcaucasus and northeastern Turkey." 4. "The natural habitat of <i>S. rosenii</i> is the mountain meadows of the Caucasus." 5. "Native of Armenia, Georgia and NE Turkey" 6. Caucasus. 7. "USSR (Caucasus)". 8. "Caucasus: W. and S. Transc. Gen. distr.: Bal.-As. Min. (Asia Minor), Arm.-Kurd". 9. "Georgia, Soviet Armenia. Ir.-Tur. element."</p>
2.04	<p>1. Atlapedia Online (http://www.atlapedia.com/online/countries/armenia.htm). 2. Atlapedia Online (http://www.atlapedia.com/online/countries/georgia.htm). 3. Microsoft Encarta World Precipitation and Average Rainfall (http://uk.encyclopedia.msn.com/encnet/RefPages/RefMedia.aspx?refid=461530746&artrefid=761554737&</p>	<p>1. For Armenia: average annual precipitation varies from 300 to 635 mm (12 to 25 inches). 2. For Georgia: along the coast average annual precipitation varies from 1,200 to 2,800 mm (47 to 110 inches) to 600 to 800 mm (24 to 31.5 inches) in the mountainous regions. 3. For Turkey, average annual precipitation ranges</p>

	pn=3&sec=-1).	from less than 10 inches/year to 40 inches/year.
2.05	1. Shulkina, T. 2004. Ornamental Plants from Russia and Adjacent States of the Former Soviet Union. Rostok, St. Petersburg, Russia. [in English]. http://www.efloras.org/florataxon.aspx?flora_id=120&taxon_id=242442591 . Accessed March, 2008. 2. www.rareplants.de (http://www.rareplants.de/shop/uploads/Html/Scilla-rosenii-_6966_1.htm).	1. "Good for the rock garden and for cut flowers." 2. Sold in Germany.
3.01		no evidence
3.02		no evidence
3.03		no evidence
3.04		no evidence
3.05	Holm, L, JV Pancho, JP Herberger, and DL Plucknett (1979) A Geographical Atlas of World Weeds. John Wiley and Sons, New York.	One congener is a common weed in Japan and Taiwan; one is present as a weed in Greece [not enough evidence to be considered weeds].
4.01	Shulkina, T. 2004. Ornamental Plants from Russia and Adjacent States of the Former Soviet Union. Rostok, St. Petersburg, Russia. [in English]. http://www.efloras.org/florataxon.aspx?flora_id=120&taxon_id=242442591 . Accessed March, 2008.	no description of these traits
4.02		
4.03	Shulkina, T. 2004. Ornamental Plants from Russia and Adjacent States of the Former Soviet Union. Rostok, St. Petersburg, Russia. [in English]. http://www.efloras.org/florataxon.aspx?flora_id=120&taxon_id=242442591 . Accessed March, 2008.	no description of parasitism
4.04		
4.05	Shulkina, T. 2004. Ornamental Plants from Russia and Adjacent States of the Former Soviet Union. Rostok, St. Petersburg, Russia. [in English]. http://www.efloras.org/florataxon.aspx?flora_id=120&taxon_id=242442591 . Accessed March, 2008.	no evidence
4.06		
4.07	Shulkina, T. 2004. Ornamental Plants from Russia and Adjacent States of the Former Soviet Union. Rostok, St. Petersburg, Russia. [in English]. http://www.efloras.org/florataxon.aspx?flora_id=120	no evidence

	&taxon_id=242442591. Accessed March, 2008.	
4.08		
4.09	1. Shulkina, T. 2004. Ornamental Plants from Russia and Adjacent States of the Former Soviet Union. Rostok, St. Petersburg, Russia. [in English]. http://www.efloras.org/florataxon.aspx?flora_id=120&taxon_id=242442591 . Accessed March, 2008. 2. www.rareplants.de (http://www.rareplants.de/shop/uploads/Html/Scilla-rosenii-_6966_1.htm). 3. ZipcodeZoo.com (http://zipcodezoo.com/Plants/S/Scilla_rosenii.asp).	1. "Prefers...a sunny or partially shaded position"; "In subalpine meadows and forest clearings" 2. "Preferably partial shade" 3. "Sun Exposure: Light Shade"
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. Shulkina, T. 2004. Ornamental Plants from Russia and Adjacent States of the Former Soviet Union. Rostok, St. Petersburg, Russia. [in English]. http://www.efloras.org/florataxon.aspx?flora_id=120&taxon_id=242442591 . Accessed March, 2008. 3. www.rareplants.de (http://www.rareplants.de/shop/uploads/Html/Scilla-rosenii-_6966_1.htm).	1. Turkey (NE): mostly mollisols with some ultisols and rocky land and very small amounts of entisols and inceptisols; Armenia: mostly rocky land with some entisols and mollisols; Georgia: mostly entisols and rocky land with small amounts of alfisols, inceptisols, mollisols, and ultisols (and a very small region of histisols) [but since the rocky land soil order type is so prevalent in all of the countries, it is difficult to determine if the species occurs more often in this type]. 2. "Prefers well-drained soil" 3. "For any humus rich, slightly moist soil".
4.11	1. Shulkina, T. 2004. Ornamental Plants from Russia and Adjacent States of the Former Soviet Union. Rostok, St. Petersburg, Russia. [in English]. http://www.efloras.org/florataxon.aspx?flora_id=120&taxon_id=242442591 . Accessed March, 2008. 2. www.rareplants.de (http://www.rareplants.de/shop/uploads/Html/Scilla-rosenii-_6966_1.htm). 3. ZipcodeZoo.com (http://zipcodezoo.com/Plants/S/Scilla_rosenii.asp). 4. Fedorov, AA (1999) Flora of Russia: The European Part and Bordering Regions. Volume IV. A.A. Balkema, Rotterdam and Brookfield, Vermont. 5. Walters, SM et al (1984) The European Garden Flora. Volume I. Pteridophyta, Gymnospermae, Angiospermae-Monocotyledons (Part I). Cambridge University Press, Cambridge (Cambridgeshire) and New York. 6. Komarov, VL (1935) Flora of the U.S.S.R. Volume IV. Liliiflorae and Microspermae. Pp. 283-288. 7. Davis, PH (1984) Flora of Turkey and the East Aegean	1. "Plants 15-20 cm." 2. "5 (15) cm" 3. "Leaves few, basal" [genus description]. 4. "Leaves basal" [genus description]. 5. "Scapes 1-4, terete, 10-25 cm". 6. "Scape 10-30(40) cm long, monanthous or terminating in several flowers". 7. "Scapes 1-4, 10-15(-23) cm, usually exceeding leaves."

	Islands. Volume 8. Pp. 219-220. Edinburgh University Press, Edinburgh.	
4.12	<p>1. Shulkina, T. 2004. Ornamental Plants from Russia and Adjacent States of the Former Soviet Union. Rostok, St. Petersburg, Russia. [in English]. http://www.efloras.org/florataxon.aspx?flora_id=120&taxon_id=242442591. Accessed March, 2008. 2. www.rareplants.de (http://www.rareplants.de/shop/uploads/Html/Scilla-rosenii-_6966_1.htm). 3. ZipcodeZoo.com (http://zipcodezoo.com/Plants/S/Scilla_rosenii.asp). 4. Fedorov, AA (1999) Flora of Russia: The European Part and Bordering Regions. Volume IV. A.A. Balkema, Rotterdam and Brookfield, Vermont. 5. Walters, SM et al (1984) The European Garden Flora. Volume I. Pteridophyta, Gymnospermae, Angiospermae-Monocotyledons (Part I). Cambridge University Press, Cambridge (Cambridgeshire) and New York. 6. Komarov, VL (1935) Flora of the U.S.S.R. Volume IV. Liliiflorae and Microspermae. Pp. 283-288. 7. Davis, PH (1984) Flora of Turkey and the East Aegean Islands. Volume 8. Pp. 219-220. Edinburgh University Press, Edinburgh.</p>	<p>1. "Plants 15-20 cm." 2. "5 (15) cm" 3. "Leaves few, basal" [genus description] 4. "Leaves basal" [genus description]. 5. "Scapes 1-4, terete, 10-25 cm". 6. "Scape 10-30(40) cm long, monanthous or terminating in several flowers". 7. "Scapes 1-4, 10-15(-23) cm, usually exceeding leaves."</p>
5.01		terrestrial
5.02	<p>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?33346).</p>	Liliaceae (Hyacinthaceae)
5.03	<p>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?33346).</p>	Liliaceae (Hyacinthaceae)
5.04	<p>1. Shulkina, T. 2004. Ornamental Plants from Russia and Adjacent States of the Former Soviet Union. Rostok, St. Petersburg, Russia. [in English]. http://www.efloras.org/florataxon.aspx?flora_id=120&taxon_id=242442591. Accessed March, 2008. 2. Fedorov, AA (1999) Flora of Russia: The European Part and Bordering Regions. Volume IV. A.A.</p>	<p>1. "Bulbs ovoid, violet-brown, 1-3 cm diam." 2. "Bulb ovoid, with 15-20 semitunicate scales of two to four annual cycles and regenerative buds" [genus description]. 3. "Bulb 1-2.5 cm in diameter, ovoid". 4. "Herbs, perennial, scapose, from bulbs. Bulbs</p>

	Balkema, Rotterdam and Brookfield, Vermont. 3. Walters, SM <i>et al</i> (1984) The European Garden Flora. Volume I. Pteridophyta, Gymnospermae, Angiospermae-Monocotyledons (Part I). Cambridge University Press, Cambridge (Cambridgeshire) and New York. 4. ZipcodeZoo.com (http://zipcodezoo.com/Plants/S/Scilla_rosenii.asp). 5. Komarov, VL (1935) Flora of the U.S.S.R. Volume IV. Liliiflorae and Microspermae. Pp. 283-288. 6. Davis, PH (1984) Flora of Turkey and the East Aegean Islands. Volume 8. Pp. 219-220. Edinburgh University Press, Edinburgh.	perennial, ovoid to globose, composed of free scales, progressively renewed annually." [genus description]. 5. "Perennial; bulb large, ovoid, to 3 cm long and 2-2.5 cm across". 6. "Bulb 1-1.5 cm diam."
6.01		no evidence
6.02	1. Shulkina, T. 2004. Ornamental Plants from Russia and Adjacent States of the Former Soviet Union. Rostok, St. Petersburg, Russia. [in English]. http://www.efloras.org/florataxon.aspx?flora_id=120&taxon_id=242442591 . Accessed March, 2008. 2. Baranova, MV (1992) New Endemic Bulbous Plants of the St. Petersburg Botanical Garden. Acta Horticulturae 325: 847-848. www.actahort.org/books/325/325_124.htm . Abstract accessed online March, 2008.	1. "P - by seed and daughter bulbs" 2. "it annually produces bulblets and abundant seeds"
6.03	Baranova, MV (1992) New Endemic Bulbous Plants of the St. Petersburg Botanical Garden. Acta Horticulturae 325: 847-848. www.actahort.org/books/325/325_124.htm . Abstract accessed online March, 2008.	" <i>Scilla rosenii</i> can be easily crossed with <i>S. sibirica</i> ."
6.04		
6.05		
6.06	1. Shulkina, T. 2004. Ornamental Plants from Russia and Adjacent States of the Former Soviet Union. Rostok, St. Petersburg, Russia. [in English]. http://www.efloras.org/florataxon.aspx?flora_id=120&taxon_id=242442591 . Accessed March, 2008. 2. Baranova, MV (1992) New Endemic Bulbous Plants of the St. Petersburg Botanical Garden. Acta Horticulturae 325: 847-848. www.actahort.org/books/325/325_124.htm . Abstract accessed online March, 2008.	1. "P - by seed and daughter bulbs". 2. "It annually produces bulblets and abundant seeds".
6.07		
7.01		
7.02	1. Shulkina, T. 2004. Ornamental Plants from Russia and Adjacent States of the Former Soviet	1. "Good for the rock garden and for

	Union. Rostok, St. Petersburg, Russia. [in English]. http://www.efloras.org/florataxon.aspx?flora_id=120&taxon_id=242442591 . Accessed March, 2008. 2. www.rareplants.de (http://www.rareplants.de/shop/uploads/Html/Scilla-rosenii-_6966_1.htm).	cut flowers." 2. Sold in Germany.
7.03		no evidence
7.04	1. Walters, SM et al (1984) The European Garden Flora. Volume I. Pteridophyta, Gymnospermae, Angiospermae-Monocotyledons (Part I). Cambridge University Press, Cambridge (Cambridgeshire) and New York. 2. ZipcodeZoo.com (http://zipcodezoo.com/Plants/S/Scilla_rosenii.asp). 3. Fedorov, AA (1999) Flora of Russia: The European Part and Bordering Regions. Volume IV. A.A. Balkema, Rotterdam and Brookfield, Vermont. 4. Komarov, VL (1935) Flora of the U.S.S.R. Volume IV. Liliiflorae and Microspermae. Pp. 283-288. 5. Davis, PH (1984) Flora of Turkey and the East Aegean Islands. Volume 8. Pp. 219-220. Edinburgh University Press, Edinburgh.	1. "Seeds to 3 × 2 mm...each with a white appendage." 2. "Seeds 3-30, not winged, globose to ellipsoid, elaiosomes present." [genus description]. 3. "Seeds globose or ovoid, black or reddish-brown, with or without arilloide" [genus description]. 4. "Capsule globose, 3-angled"; "seeds black, globose or oblong" [genus description]. 5. "Seeds ovoid, c. 3 × 2 mm, pale brown with white cylindrical caruncle." [no evidence of adaptations to wind dispersal]
7.05		
7.06		
7.07	1. Walters, SM et al (1984) The European Garden Flora. Volume I. Pteridophyta, Gymnospermae, Angiospermae-Monocotyledons (Part I). Cambridge University Press, Cambridge (Cambridgeshire) and New York. 2. ZipcodeZoo.com (http://zipcodezoo.com/Plants/S/Scilla_rosenii.asp). 3. Fedorov, AA (1999) Flora of Russia: The European Part and Bordering Regions. Volume IV. A.A. Balkema, Rotterdam and Brookfield, Vermont. 4. Komarov, VL (1935) Flora of the U.S.S.R. Volume IV. Liliiflorae and Microspermae. Pp. 283-288. 5. Davis, PH (1984) Flora of Turkey and the East Aegean Islands. Volume 8. Pp. 219-220. Edinburgh University Press, Edinburgh.	1. "Seeds to 3 × 2 mm...each with a white appendage." 2. "Seeds 3-30, not winged, globose to ellipsoid, elaiosomes present." [genus description]. 3. "Seeds globose or ovoid, black or reddish-brown, with or without arilloide" [genus description]. 4. "Capsule globose, 3-angled"; "seeds black, globose or oblong" [genus description]. 5. "Seeds ovoid, c. 3 × 2 mm, pale brown with white cylindrical caruncle." [no evidence of adaptations to external dispersal]
7.08		
8.01	Baranova, MV (1992) New Endemic Bulbous Plants of the St. Petersburg Botanical Garden. Acta Horticulturae 325: 847-848. www.actahort.org/books/325/325_124.htm . Abstract accessed online March, 2008.	It annually produces bulblets and abundant seeds.

8.02		
8.03		
8.04		
8.05		