

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>Berberis iberica</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?	?	
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	y	2
4.01	Produces spines, thorns or burrs	y	1
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		
5.01	Aquatic	n	0

5.02	Grass	n	0
5.03	Nitrogen fixing woody plant	n	0
5.04	Geophyte	n	0
6.01	Evidence of substantial reproductive failure in native habitat	n	0
6.02	Produces viable seed		
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	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	y	1
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	Evaluate
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section	# questions answered	satisfy minimum?
A	10	Yes
B	6	Yes
C	10	Yes
total	26	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%20Igcd.tif). 2. Czerepanov, SK (1995) Vascular Plants of Russia and Adjacent States (the former USSR). Cambridge University Press, Cambridge and New York. 3. Eristavi, M, Shulkina, T, Sikhuralidze, S, and Asieshvili, L. Rare, Endangered and Vulnerable Plants of the Republic of Georgia. http://www.mobot.org/MOBOT/Research/georgia/checklist.pdf. Accessed March, 2008. 4. Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Pp. 422, 426. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970).</p>	<p>1. Global plant hardiness zones 4-6. 2. Native to Caucasus and Middle Asia 3. Native to Northern Caucasus (Dagestania), Transcaucasus: Georgia (Kartli, Kiziki), Azerbaijan, Armenia; endemic to the Caucasus. 4. "Caucasus: E. Transc. (Tbilisi). Gen. distr.: As.-Min., Arm. - Kurd., Iran."</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. Eristavi, M, Shulkina, T, Sikhuralidze, S, and Asieshvili, L. Rare, Endangered and Vulnerable Plants of the Republic of Georgia. http://www.mobot.org/MOBOT/Research/georgia/checklist.pdf. Accessed March, 2008. 4. Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Pp. 422, 426. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970).</p>	<p>1. Only two climatic regions. 2. Native to Caucasus and Middle Asia 3. Native to Northern Caucasus (Dagestania), Transcaucasus: Georgia (Kartli, Kiziki), Azerbaijan, Armenia; endemic to the Caucasus. 4. "Caucasus: E. Transc. (Tbilisi). Gen. distr.: As.-Min., Arm. - Kurd., Iran."</p>
2.04	<p>1. Atlapedia Online (http://www.atlapedia.com/online/countries/azerbaij.htm). 2. Atlapedia Online (http://www.atlapedia.com/online/countries/armenia.htm). 3. Atlapedia Online (http://www.atlapedia.com/online/countries/georgia.htm).</p>	<p>1. 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. For Armenia: average annual</p>

		precipitation varies from 300 to 635 mm (12 to 25 inches). 3. 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.
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. Henderson, L (2001) Alien weeds and invasive plants: a complete guide to declared weeds and invaders in South Africa, including another 36 species invasive in that region. Plant Protection Research Institute, Pretoria. 3. Weber, E (2003) Invasive Plant Species of the World. CAB International, Oxon, United Kingdom.	1. One congener is a principal weed in Australia and Canada and a serious weed in New Zealand. 7 congeners are present as weeds in the USA and Canada. 2. <i>Berberis thunbergii</i> is listed as a "Proposed weed and invader plant" in South Africa. 3. One congener is invasive in Australia and New Zealand.
4.01	1. Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Pp. 422, 426. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970). 2. de Candolle, AP (1873) Berberideae. Pp. 105-106. <i>In Prodrromus systematis naturalis regni vegetabilis, sive enumeratio contracta ordinum generum specierumque plantarum huc usque cognitarium, juxta methodi naturalis, normas digesta.</i> Sumptibus Sociorum Treuttel et Würtz, Paris. 3. Walters, SM (1984) The European Garden Flora. Volume III. Dicotyledons (Part I). P. 373. Cambridge University Press, Cambridge (Cambridgeshire) and New York.	1. "Prickles simple, firm, slightly dilated at base, 20 mm long." 2. "spinis simplicibus" [spines simple]. 3. "Spiny prostrate to erect shrubs"; "spines with 1-3 (rarely 7) prongs, occasionally leaf-like" [genus description].
4.02		
4.03	Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Pp. 422, 426. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970).	no description of parasitism

4.04		
4.05	Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Pp. 422, 426. 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. Pp. 422, 426. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970).	"Most species of <i>Berberis</i> are of economic importance, since the berries of all the species are delicious raw and as preserves." [genus description]. [no evidence of toxicity]
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).	Mollisols and alfisols occur in the region of origin.
4.11	1. Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Pp. 422, 426. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970). 2. Walters, SM (1984) The European Garden Flora. Volume III. Dicotyledons (Part I). P. 373. Cambridge University Press, Cambridge (Cambridgeshire) and New York.	1. "Shrub, 1 m high". 2. "Spiny prostrate to erect shrubs" [genus description].
4.12		
5.01		terrestrial
5.02		Berberidaceae
5.03		Berberidaceae
5.04	1. Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Pp. 422, 426. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970). 2. Walters, SM (1984) The European Garden Flora. Volume III. Dicotyledons (Part I). P. 373. Cambridge University Press, Cambridge (Cambridgeshire) and New York.	1. "Shrub, 1 m high". 2. "Spiny prostrate to erect shrubs" [genus description].
6.01		no evidence
6.02		
6.03		
6.04		
6.05		
6.06		
6.07		

7.01		
7.02		no evidence
7.03		no evidence
7.04	1. Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Pp. 422, 426. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970). 2. Walters, SM (1984) The European Garden Flora. Volume III. Dicotyledons (Part I). P. 373. Cambridge University Press, Cambridge (Cambridgeshire) and New York.	1. "Fruit an indehiscent berry"; "berries red"; "berries oblong" [genus description]. 2. "Berries spherical to ellipsoid, fleshy, red or black" [genus description]. [no evidence of adaptations to wind dispersal]
7.05		
7.06	1. Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Pp. 422, 426. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970). 2. Walters, SM (1984) The European Garden Flora. Volume III. Dicotyledons (Part I). P. 373. Cambridge University Press, Cambridge (Cambridgeshire) and New York.	1. "Fruit an indehiscent berry"; "berries red"; "berries oblong" [genus description]. 2. "Berries spherical to ellipsoid, fleshy, red or black" [genus description]
7.07	1. Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Pp. 422, 426. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970). 2. Walters, SM (1984) The European Garden Flora. Volume III. Dicotyledons (Part I). P. 373. Cambridge University Press, Cambridge (Cambridgeshire) and New York.	1. "Fruit an indehiscent berry"; "berries red"; "berries oblong" [genus description]. 2. "Berries spherical to ellipsoid, fleshy, red or black" [genus description]. [no evidence of adaptations to external dispersal]
7.08	1. Shishkin, BK (1937) Flora of the U.S.S.R. Volume VII. Pp. 422, 426. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1970). 2. Walters, SM (1984) The European Garden Flora. Volume III. Dicotyledons (Part I). P. 373. Cambridge University Press, Cambridge (Cambridgeshire) and New York.	1. "Fruit an indehiscent berry"; "berries red"; "berries oblong" [genus description]. 2. "Berries spherical to ellipsoid, fleshy, red or black" [genus description]
8.01		
8.02		
8.03		
8.04		
8.05		