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

Filipendula glaberrima (=F. koreana)			
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	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	y	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			-2

Outcome	**Accept**

section	**# questions answered**	**satisfy minimum?**
A	11	Yes
B	6	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	1. PERAL NAPPFAST Global Plant Hardiness (http://www.nappfast.org/Plant_hardiness/NAPPFAST%20Global%20zones/10-year%20climate/PLANT_HARDINESS_10YR%20lgnd.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?446942). 3. Czerepanov, SK (1995) Vascular Plants of Russia and Adjacent States (the former USSR). Cambridge University Press, Cambridge and New York. 4. Schanzer, IA (1994) Taxonomic revision of the genus *Filipendula* Mill. (Rosaceae). Journal of Japanese Botany 69: 290-319. 5. Shimizu, T (1961) Taxonomical Notes on the Genus Filipendula Adans. (Rosaceae). Journal of the Faculty of Textile Science & Technology, Shinshu Univ., Series A, Biology 26: 1-30. 6. Ohwi, J (1953) Flora of Japan (in English). Edited by Meyer, FG and Walker, EH. Smithsonian Institution, Washington, D.C. (1965). 7. Shishkin, BK and Yuzepchuk, SV (1941) Flora of the U.S.S.R. Volume X. Rosaceae - Rosoideae, Prunoideae. Pp. 208-210. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1971).	1. Global plant hardiness zones 2-6. 2. Soviet Far East: Russian Federation - Khabarovsk, Primorye; China: China - Heilongjiang, Jilin, Liaoning; Eastern Asia: Japan - Hokkaido; Korea. 3. Distribution: Far East 4. "Distribution: Primorsky and Khabarovsk Provinces of the Russian Far East, NE China, Korea, Hokkaido and Kunashir Islands." 5. "Distr. Ussuri and Korea". 6. "Hokkaido". 7. "Far East: Uss., Uda. Gen. distr.: Jap. - Ch. Described from Korea."
2.02		
2.03	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?446942). 3. Czerepanov, SK (1995) Vascular Plants of Russia and Adjacent States (the former USSR). Cambridge University Press, Cambridge and New York. 4. Schanzer, IA	1. Only two climatic regions. 2. Soviet Far East: Russian Federation - Khabarovsk, Primorye; China: China - Heilongjiang, Jilin, Liaoning; Eastern Asia: Japan - Hokkaido; Korea. 3. Distribution: Far East 4. "Distribution: Primorsky and Khabarovsk Provinces of the Russian Far East, NE China, Korea, Hokkaido and Kunashir Islands." 5. "Distr. Ussuri and Korea". 6.

	(1994) Taxonomic revision of the genus *Filipendula* Mill. (Rosaceae). Journal of Japanese Botany 69: 290-319. 5. Shimizu, T (1961) Taxonomical Notes on the Genus Filipendula Adans. (Rosaceae). Journal of the Faculty of Textile Science & Technology, Shinshu Univ., Series A, Biology 26: 1-30. 6. Ohwi, J (1953) Flora of Japan (in English). Edited by Meyer, FG and Walker, EH. Smithsonian Institution, Washington, D.C. (1965). 7. Shishkin, BK and Yuzepchuk, SV (1941) Flora of the U.S.S.R. Volume X. Rosaceae - Rosoideae, Prunoideae. Pp. 208-210. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1971).	"Hokkaido". 7. "Far East: Uss., Uda. Gen. distr.: Jap. - Ch. Described from Korea."
2.04	1. Climate Source (http://www.climatesource.com/cn/fact_sheets/chinapt_xl.jpg). 2. MSN Encarta (http://encarta.msn.com/encyclopedia_761566679_4/Japan.html). 3. For North Korea: "The wettest months are from July to September when up to 85% of rainfall occurs while average annual precipitation varies from 560 mm (22 inches) to 1,520 mm (60 inches) depending on the region." 4. For South Korea: "Average annual precipitation varies from 1,016 mm (40 inches) to 1,524 mm (60 inches) depending on each region." 5. Atlapedia Online (http://www.atlapedia.com/online/countries/russia.htm).	1. In the provinces listed for China, average annual precipitation ranges from 11.8 in/yr to 47.2 in/yr. 2. Average annual precipitation in Sapporo (north) [Hokkaido is the north island]. 3. For North Korea: "The wettest months are from July to September when up to 85% of rainfall occurs while average annual precipitation varies from 560 mm (22 inches) to 1,520 mm (60 inches) depending on the region." 4. For South Korea: "Average annual precipitation varies from 1,016 mm (40 inches) to 1,524 mm (60 inches) depending on each region." 5. For the Russian Federation: rainfall is highest in the westerly mountain regions which has an average annual precipitation of up to 2,000 mm (79 inches) while on the East European Plain it averages between 600 and 700 mm (24 to 27.5 inches) and up to 1,000 (39 inches) in the southern areas of the Far East.
2.05	B & T World Seeds (http://www.b-and-t-world-seeds.com/carth.asp?species=Filipendula%20glaberrima&sref=520226).	Sold internationally.
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 present as a weed in Belgium. [not enough evidence to be considered a weed]
4.01	1. Shimizu, T (1961) Taxonomical Notes on the Genus Filipendula Adans. (Rosaceae). Journal of the Faculty of Textile Science & Technology, Shinshu Univ., Series A, Biology 26: 1-30. 2. Ohwi, J (1953) Flora of Japan (in English). Edited by Meyer, FG and Walker, EH. Smithsonian Institution, Washington, D.C. (1965). 3. Shishkin, BK and Yuzepchuk, SV (1941) Flora of the U.S.S.R. Volume X. Rosaceae - Rosoideae, Prunoideae. Pp. 208-210. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1971).	no description of these traits
4.02		
4.03	1. Shimizu, T (1961) Taxonomical Notes on the Genus Filipendula Adans. (Rosaceae). Journal of the Faculty of Textile Science & Technology, Shinshu Univ., Series A, Biology 26: 1-30. 2. Ohwi, J (1953) Flora of Japan (in English). Edited by Meyer, FG and Walker, EH. Smithsonian Institution, Washington, D.C. (1965). 3. Shishkin, BK and Yuzepchuk, SV (1941) Flora of the U.S.S.R. Volume X. Rosaceae - Rosoideae, Prunoideae. Pp. 208-210. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1971).	no description of parasitism
4.04		
4.05	1. Shimizu, T (1961) Taxonomical Notes on the Genus Filipendula Adans. (Rosaceae). Journal of the Faculty of Textile Science & Technology, Shinshu Univ., Series A, Biology 26: 1-30. 2. Ohwi, J (1953) Flora of Japan (in English). Edited by Meyer, FG and Walker, EH. Smithsonian Institution, Washington, D.C. (1965). 3. Shishkin, BK and Yuzepchuk, SV (1941) Flora of the U.S.S.R. Volume X. Rosaceae - Rosoideae, Prunoideae. Pp. 208-210. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem	no evidence

	(1971).	
4.06		
4.07	1. Shimizu, T (1961) Taxonomical Notes on the Genus Filipendula Adans. (Rosaceae). Journal of the Faculty of Textile Science & Technology, Shinshu Univ., Series A, Biology 26: 1-30. 2. Ohwi, J (1953) Flora of Japan (in English). Edited by Meyer, FG and Walker, EH. Smithsonian Institution, Washington, D.C. (1965). 3. Shishkin, BK and Yuzepchuk, SV (1941) Flora of the U.S.S.R. Volume X. Rosaceae - Rosoideae, Prunoideae. Pp. 208-210. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1971).	no evidence
4.08		
4.09		
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. Schanzer, IA (1994) Taxonomic revision of the genus Filipendula Mill. (Rosaceae). Journal of Japanese Botany 69: 290-319.	1. Russian Federation (these are very approximate estimates): Khabarovsk: mostly rocky land, with very small amounts of gelisols, histisols, and inceptisols in the far north and along the western border of the province. There are some alfisols along the western border of the province; Primorye: alfisols, inceptisols, rocky land; Ussuri: rocky land, alfisols, some mollisols; China (these are very approximate estimates): Heilongjiang: mollisols, alfisols, inceptisols, rocky land; Jilin: alfisols, mollisols, inceptisols, rocky land; Liaoning: entisols, inceptisols, mollisols, alfisols; Japan: Hokkaido: entisols, inceptisols, rocky land (mostly), andisols; Korea: entisols (mostly), ultisols (small amount), rocky land (small amount). 2. "Habitat: banks of mountain creeks in forests and meadows"
4.11	1. Shimizu, T (1961) Taxonomical Notes on the Genus Filipendula Adans. (Rosaceae). Journal of the Faculty of Textile Science & Technology, Shinshu Univ., Series A, Biology 26: 1-30. 2. Ohwi, J (1953) Flora of Japan (in English). Edited by Meyer, FG and Walker, EH. Smithsonian Institution, Washington, D.C. (1965). 3. Shishkin, BK and Yuzepchuk, SV	1. "The plants grouped to *Filipendula* are middle- or large-sized perennial herbs." [genus description]. 2. "Nearly glabrous perennial herb; stems 30-100 cm. long." 3. "Perennial; plant with short rootstock, taller than 1

	(1941) Flora of the U.S.S.R. Volume X. Rosaceae - Rosoideae, Prunoideae. Pp. 208-210. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1971).	m…stems erect."
4.12	Schanzer, IA (1994) Taxonomic revision of the genus Filipendula Mill. (Rosaceae). Journal of Japanese Botany 69: 290-319.	"Habitat: banks of mountain creeks in forests and meadows, usually in small groups."
5.01		terrestrial
5.02	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?446942).	Rosaceae
5.03	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?446942).	Rosaceae
5.04	1. Shimizu, T (1961) Taxonomical Notes on the Genus *Filipendula* Adans. (*Rosaceae*). Journal of the Faculty of Textile Science & Technology, Shinshu Univ., Series A, Biology 26: 1-30. 2. Chaoluan, L, Ikeda, H, and Ohba, H (1994) *Filipendula glaberrima*. P. 194. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis). 3. Schanzer, IA (1994) Taxonomic revision of the genus Filipendula Mill. (Rosaceae). Journal of Japanese Botany 69: 290-319. 4. Shishkin, BK and Yuzepchuk, SV (1941) Flora of the U.S.S.R. Volume X. Rosaceae - Rosoideae, Prunoideae. Pp. 208-210. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1971). 5. Walters, SM et al (1984) The European Garden Flora. Volume IV. Dicotyledons (Part II). P. 343. Cambridge University Press, Cambridge (Cambridgeshire) and New York.	1. "Root never tuberous". 2. "Herbs perennial, rhizomatous. Rhizome short, oblique, here and there thickened into tubers, clothed with fibers." [genus description]. 3. *Filipendula* species are mainly shortly rhizomatous herbs with sympodially branching rhizomes. This type of a life form I consider to be a primary one." [genus description]. 4. "Perennial; plant with short rootstock"; "roots not tuberous". 5. "Perennial herbs (often large) with tuberous roots or with rhizomes" [genus description].
6.01		no evidence
6.02	Walters, SM et al (1984) The European Garden Flora. Volume IV. Dicotyledons (Part II). P. 343.	"The species are…propagated by seed or by division" [genus description].

6.03		
6.04		
6.05		
6.06	1. Chaoluan, L, Ikeda, H, and Ohba, H (1994) *Filipendula glaberrima*. P. 194. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis). 2. Schanzer, IA (1994) Taxonomic revision of the genus Filipendula Mill. (Rosaceae). Journal of Japanese Botany 69: 290-319. 3. Shishkin, BK and Yuzepchuk, SV (1941) Flora of the U.S.S.R. Volume X. Rosaceae - Rosoideae, Prunoideae. Pp. 208-210. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1971). 4. Walters, SM *et al* (1984) The European Garden Flora. Volume IV. Dicotyledons (Part II). P. 343. Cambridge University Press, Cambridge (Cambridgeshire) and New York.	1. "Herbs perennial, rhizomatous. Rhizome short, oblique, here and there thickened into tubers, clothed with fibers." [genus description]. 2. *Filipendula* species are mainly shortly rhizomatous herbs with sympodially branching rhizomes. This type of a life form I consider to be a primary one." [genus description]. 3. "Perennial; plant with short rootstock". 4. "Perennial herbs (often large) with tuberous roots or with rhizomes" [genus description].
6.07		
7.01		
7.02	B & T World Seeds (http://www.b-and-t-world-seeds.com/carth.asp?species=Filipendula%20glaberrima&sref=520226).	Sold internationally.
7.03		no evidence
7.04	1. Chaoluan, L, Ikeda, H, and Ohba, H (1994) *Filipendula glaberrima*. P. 194. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis). 2. Schanzer, IA (1994) Taxonomic revision of the genus Filipendula Mill. (Rosaceae). Journal of Japanese Botany 69: 290-319. 3. Shimizu, T (1961) Taxonomical Notes on the Genus Filipendula Adans. (Rosaceae). Journal of the Faculty of Textile Science & Technology, Shinshu Univ., Series A, Biology 26: 1-30. 4. Ohwi, J (1953) Flora of Japan (in English). Edited by Meyer, FG and Walker, EH. Smithsonian Institution, Washington, D.C. (1965). 5. Shishkin, BK and Yuzepchuk, SV (1941) Flora of the U.S.S.R. Volume X. Rosaceae - Rosoideae, Prunoideae. Pp. 208-210. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1971).	1. "Achenes erect, stipitate, long ciliate along abaxial and adaxial sides" [species description]; "The fruit of *Filipendula* has been described as an indehiscent follicle. It is described here as an achene because it is indehiscent, as opposed to a typical, dehiscent follicle. In fact, it may be intermediate between an achene and a follicle."; "Seed pendulous, terete, with very little endosperm" [genus description] 2. Achene approximately 2 mm. [drawing of *F. glaberrima* achene with scale bar shown on p. 294]. 3. "Achenes stipitate...attenuate towards the bases". 4. "Achenes short-stiped, oblong, glabrous". 5. "Fruitlets 5, erect, tapering then short-stalked" [species description]; "Fruit an indehiscent 1-seeded follicle" [genus description]. [no evidence of

		adaptations to wind dispersal]
7.05		
7.06		
7.07	1. Chaoluan, L, Ikeda, H, and Ohba, H (1994) *Filipendula glaberrima*. P. 194. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis). 2. Schanzer, IA (1994) Taxonomic revision of the genus Filipendula Mill. (Rosaceae). Journal of Japanese Botany 69: 290-319. 3. Shimizu, T (1961) Taxonomical Notes on the Genus Filipendula Adans. (Rosaceae). Journal of the Faculty of Textile Science & Technology, Shinshu Univ., Series A, Biology 26: 1-30. 4. Ohwi, J (1953) Flora of Japan (in English). Edited by Meyer, FG and Walker, EH. Smithsonian Institution, Washington, D.C. (1965). 5. Shishkin, BK and Yuzepchuk, SV (1941) Flora of the U.S.S.R. Volume X. Rosaceae - Rosoideae, Prunoideae. Pp. 208-210. Izdatel'stvo Akademii Nauk SSSR, Moskva-Leningrad and Israel Program for Scientific Translations, Jerusalem (1971).	1. "Achenes erect, stipitate, long ciliate along abaxial and adaxial sides" [species description]; "The fruit of *Filipendula* has been described as an indehiscent follicle. It is described here as an achene because it is indehiscent, as opposed to a typical, dehiscent follicle. In fact, it may be intermediate between an achene and a follicle."; "Seed pendulous, terete, with very little endosperm" [genus description] 2. Achene approximately 2 mm. [drawing of *F. glaberrima* achene with scale bar shown on p. 294]. 3. "Achenes stipitate...attenuate towards the bases". 4. "Achenes short-stiped, oblong, glabrous". 5. "Fruitlets 5, erect, tapering then short-stalked" [species description]; "Fruit an indehiscent 1-seeded follicle" [genus description]. [no evidence of adaptations to external dispersal]
7.08		
8.01		
8.02		
8.03		
8.04		
8.05		