MN NWAC Risk Assessment Worksheet (04-2011)	Common Name	*Latin Name*
	Porcelain Berry, Porcelain Ampelopsis, Porcelain-vine, Amur Peppervine, Wild Grape	***Ampelopsis brevipedunculata* (Maxim.) Trautv.** (synonyms: *Ampelopsis glandulosa* & var. *brevipedunculata*, var. *glandulosa*, and var. *heterophylla*, *Ampelopsis sinica*, and *Vitis heterophylla*)
Reviewer	**Affiliation/Organization**	**Date (mm/dd/yyyy)**
James Calkins	**Minnehaha Creek Watershed District**	**07/21/2014**

Porcelain berry (*Ampelopsis brevipedunculata*) is a vigorous, deciduous, woody vine in the grape family (Vitaceae). Plants have variable, occasionally simple, cordate (heart-shaped), but most often maple/grape-like, 3- to 5-lobed, alternately arranged, toothed leaves (shiny on undersides with minute hairs along the veins). Plants have a fairly loose, rambling habit, are relatively fast growing, and climb by branched tendrils (modified leaves) attached opposite the leaves; plants can reach a height of 10-25 feet or more. Native to temperate Asia (China, Korea, Japan, and eastern Russia), porcelain berry was introduced as a landscape plant in 1870 and has since escaped cultivation and become naturalized in parts of the eastern United States. The flowers are perfect and borne in loose cymes from July until frost (September) in Minnesota and are greenish in color and small and insignificant; plants flower on new growth and are insect pollinated. The fruit is a shiny, 1- to 4-seeded berry that matures in September and October in Minnesota. As they mature, the fruits in a single cluster may be variously pale green to creamy yellow, lilac-pink, lavender, sky blue, purple and indigo-blue; mature fruits are various shades of blue and purple. The distinctively-colored fruits develop a speckled to mottled pattern that resembles the crackled appearance of porcelain which gives rise to the common name porcelain berry. Plants prefer and perform best in full sun, but tolerate partial shade; flowering and fruiting are best in full sun. Plants are intolerant of dense shade. Planted for its vining habit, attractive foliage, and its uniquely-colored, attractive fruit (the unique colors of the fruit result from a co-pigmentation effect), porcelain berry is occasionally, but not widely, planted in Minnesota. The fruits of porcelain berry are eaten and dispersed by birds and various small mammals (and perhaps white-tailed deer; *Odocoileus virginianus*). Plants are adaptable and will grow on most soils except those that are poorly drained or permanently wet. Plants prefer moist, well drained soils, but are fairly tolerant of dry soils once established; plants are also tolerant of urban stresses including heat, drought, and compacted and infertile soils. Cold hardy to U.S.D.A. Cold Hardiness Zone 4/5, (-20 to -30ºF; -29 to -34ºC/-10 to -20ºF; -23 to -29ºC), winter injury is fairly common in Minnesota and remedial pruning to remove dead wood is often required; plants are, however, typically root-hardy and plants killed to the ground during the winter will usually recover. Varieties and cultivars include var. *maximowiczii* (syn. *A. heterophylla*; sinuses of the 3- to 5-lobed leaves cut more deeply than the species and the form most often found in cultivation) and 'Elegans' (a cultivar of the variety *maximowiczii* having

smaller leaves and greenish-white and pink variegated foliage that becomes exclusively green and white with age; less vigorous and less hardy than the species). Porcelain berry is a favorite of Japanese beetles (*Popillia japonica*) and the damage can be severe with the foliage being completely skeletonized very quickly when Japanese beetles are present. Porcelain berry is commercially propagated from softwood cuttings and cleaned, stratified seed; plants can also be propagated by layering and perhaps by root pieces (root cuttings). Related species include *Ampelopsis aconitifolia* (monks hood vine; native to Mongolia and northern China; orange, yellow, and sometimes bluish fruit; Zone 5), *A. arborea* (pepper vine/peppervine; native to the southeastern United States – Maryland to Missouri and south to Mexico and Florida; dark purple fruit; Zone 7), *A. cordata* (heart-leaf peppervine, heart-leaf ampelopsis, raccoon grape, possum grape, simple-leaf ampelopsis; native to the southeastern United States; pinkish-purple to lavender-blue fruit; Zone 5), *A. humulifolia* (hops ampelopsis; native to northern China; pale yellow to bluish fruit; Zone 6), and *A. megalophylla* (native to western China; black fruit; Zone 5); all five are less cold hardy than *A. brevipedunculata* and none of them perform well in zones warmer than Zone 8. In Minnesota, depending on the foliage characteristics of specific plants, porcelain berry could be confused with our native riverbank grape (*Vitis riparia*); the pith of porcelain berry is white and continuous across the nodes and the bark bears obvious lenticels and does not peel while riverbank grape has a brown pith that is interrupted at the nodes and exfoliating (peeling) bark without distinct lenticels; also, unlike porcelain berry, the tendrils of riverbank grape are not branched and the flowers (and fruits) are borne in elongated panicles.

Box	**Question**	**Answer**	**Outcome** (i.e., Go to box:?)
1	Is the plant species or genotype non-native?	Yes; native to temperate Asia, China, Korea, Japan, and eastern Russia; introduced as a landscape plant in 1870.	Go to Box 3
2	Does the plant species pose significant human or livestock concerns or have the potential to significantly harm agricultural production?		
	A. Does the plant have toxic qualities that pose a significant risk to livestock, wildlife, or people?	***No; berries may have toxic qualities, but the idea that the berries are poisonous doesn't stand out in the literature as a significant concern; information found seems to be primarily anecdotal and is relatively obscure and mixed variously indicating the fruits are both poisonous and edible or saying nothing at all; one a veterinary clinic in New Hampshire includes porcelain berry on a list of plants poisonous to dogs; probably best if avoided, but doesn't appear to be a major concern.***	***Blue text is provided as additional information not directed through the decision tree process for this particular risk assessment.***

Box	Question	Answer	Outcome (i.e., Go to box:?)
	B. Does the plant cause significant financial losses associated with decreased yields, reduced quality, or increased production costs?	***No.***	
3	Is the plant species, or a related species, documented as being a problem elsewhere?	Yes; variously reported to be present outside cultivation or invasive in eleven states (Connecticut, Delaware, Massachusetts, Maryland, New Jersey, New York, Pennsylvania, Rhode Island, Virginia, West Virginia, and Wisconsin) and the District of Columbia (Washington D.C.); also reported to be present in Georgia, Iowa, Illinois, Kentucky, Michigan, North Carolina, New Hampshire, and Ohio; listed as potentially invasive in Connecticut (but not currently regulated) and invasive in Massachusetts (prohibited) and Wisconsin (prohibited).	Go to Box 6
4	Are the plant's life history & growth requirements sufficiently understood?	***Yes; grows in habitats similar to those inhabited by riverbank grape (Vitis riparia); has the potential to invade streambanks, forest edges, woodland openings, and open areas; primarily associated with disturbed sites and seems to be considered an early successional species; information on fecundity and seedling hardiness in Minnesota or similar climates not found.***	
5	Gather and evaluate further information:	(Comments/Notes)	
6	Does the plant species have the capacity to establish and survive in Minnesota?	Yes; hardy to USDA Cold Hardiness Zone 4/5; winter injury is common, but plants typically recover from the base and flower on new wood.	

Box	Question	Answer	Outcome (i.e., Go to box:?)
	A.Is the plant, or a close relative, currently established in Minnesota?	Yes; plants are present at the Minnesota Landscape Arboretum in Chanhassen, MN, and in private landscapes; the species has not been noted as an escape at the Arboretum or formally reported as invasive in Minnesota; riverbank grape (*Vitis riparia*), Virginia creeper (*Parthenocissus quinquefolia*), and thicket creeper (*Parthenocissus inserta*) are relatives that are native to Minnesota and Boston ivy (*Parthenocissus tricuspidata*) is grown as a landscape plant in Minnesota (same family – Vitaceae).	Go to Box 7
	B. Has the plant become established in areas having a climate and growing conditions similar to those found in Minnesota?	***Yes; primarily in the northeastern United States.***	
7	Does the plant species have the potential to reproduce and spread in Minnesota?		
	A. Does the plant reproduce by asexual/vegetative means?	Yes; root suckers and dislodged root pieces have been suggested as potential methods of vegetative reproduction. No; no definitive documentation has been found, including in propagation references where only seeds, stem cuttings, and layering are mentioned.	If Yes, go to Question B If No, go to Question C
	B. Are the asexual propagules effectively dispersed to new areas?	Yes; it has been suggested that root pieces may be moved downstream by water in riparian areas. No; the reports of downstream movement of root pieces are anecdotal and not scientifically documented.	If Yes, go to Question I If No, go to Question C

Box	Question	Answer	Outcome (i.e., Go to box:?)
	C. Does the plant produce large amounts of viable, cold-hardy seeds?	Yes; 1-4 seeds present in fruits (berries), viable seed is produced in Ohio. No; other than the Ohio reference, no documentation has been found on the number of viable seeds produced, including whether viable seed is typically produced in Minnesota; one study indicated that seed production in Japan was highly variable; this lack of information on seed production and whether seedlings are capable of surviving a Minnesota winter are important gaps in information about this species and its ability to escape in Minnesota.	If Yes, go to Question F If No, go to Question D
	D. If the species produces low numbers of viable seeds, does it have a high level of seed/seedling vigor or do the seeds remain viable for an extended period?	Yes; again, no documentation on the number of seeds produced and the cold hardiness of seedlings has been found; seeds are reported to have a high germination rate and seeds may remain viable in the soil for at least several years.	Go to Question F
	E. Is the species self-fertile?	***Probably not, but no specific information found; most grapes are self-fertile, though.***	
	F. Are sexual propagules – viable seeds – effectively dispersed to new areas?	Yes; fruits eaten by birds and small mammals (and perhaps white-tailed deer; *Odocoileus virginianus*) and are dispersed via droppings; one study suggests the unique coloration of the fruits would be of special interest to birds and that the fruits have a chemical composition (polyphenolic tannins and calcium oxalate) that should make them unpalatable by mammals; reportedly found growing in riparian areas downstream from established patches leading to the idea that fruits or seeds may be dispersed by water.	Go to Question I
	G. Can the species hybridize with native species (or other introduced species) and produce viable seed and fertile offspring in the absence of human intervention?	***No; not likely to hybridize with riverbank grape or any of the Parthenocissus that are native or grown in Minnesota.***	

Box	Question	Answer	Outcome (i.e., Go to box:?)
	H. If the species is woody (trees, shrubs, and woody vines) is the juvenile period less than or equal to 5 years for tree species or 3 years for shrubs and vines?	***Yes; plants can reportedly begin to flower and fruit in their second year from seed; plants flower on new wood and plants that are cut back or killed to the ground by winter temperatures can recover and flower and fruit the following year.***	
	I. Do natural controls exist, species native to Minnesota, that are documented to effectively prevent the spread of the plant in question? Note: Regardless of the potential combinations of answers to the previous questions, each of the potential pathways through the risk assessment protocol ultimately end up at Question I.	No; porcelain berry is, however, reported (and has been personally observed) as being a favorite of Japanese beetles (*Popillia japonica*; a non-native species that is present in Minnesota).	Go to Box 8
8	Does the plant species pose significant human or livestock concerns or have the potential to significantly harm agricultural production, native ecosystems, or managed landscapes?		
	A. Does the plant have toxic qualities, or other detrimental qualities, that pose a significant risk to livestock, wildlife, or people?	No (see Box 2, Question A).	Go to Question B
	B. Does, or could, the plant cause significant financial losses associated with decreased yields, reduced crop quality, or increased production costs?	No.	Go to Question C
	C. Can the plant aggressively displace native species through competition (including allelopathic effects)?	Yes; forms dense mats that cover and shade out low vegetation and small trees.	Go to Box 9
	D. Can the plant hybridize with native species resulting in a modified gene pool and potentially negative impacts on native populations?	***No (see Box 7, Question G).***	

Box	Question	Answer	Outcome (i.e., Go to box:?)
	E. Does the plant have the potential to change native ecosystems (adds a vegetative layer, affects ground or surface water levels, etc.)?	***Yes, or at least probably in the short term; seems to be primarily considered an early successional species.***	
	F. Does the plant have the potential to introduce or harbor another pest or serve as an alternate host?	***Yes; porcelain berry, along with several species native to Minnesota, can serve as an alternative host for bacterial leaf scorch (Xylella fastidiosa) which can cause disease on a number of native and introduced plant species in Minnesota.***	
9	Does the plant species have clearly defined benefits that outweigh associated negative impacts?		
	A. Is the plant currently being used or produced and/or sold in Minnesota or native to Minnesota?	Yes; porcelain berry is grown and sold as a landscape plant in Minnesota	Go to Question B
	B. Is the plant an introduced species and can its spread be effectively and easily prevented or controlled, or its negative impacts minimized through carefully designed and executed management practices?	Yes (an introduced species) and No; dispersed by birds and perhaps other animals; although removing flowers or fruit clusters from plants in landscape settings would be practicable, the showy fruits are a primary reason for growing porcelain berry.	Go to Question C
	C. Is the plant native to Minnesota?	No.	Go to Question D
	D. Is a non-invasive, alternative plant material commercially available that could serve the same purpose as the plant of concern?	Yes; American bittersweet (*Celastrus scandens*) is one example and, although the fruits and foliage are not as showy, riverbank grape (*Vitis riparia*), native vine-type honeysuckles (*Lonicera* spp.), and virgin's bower/old man's beard (*Clematis virginiana*), and other native and introduced vines are hardier and might be considered suitable alternative. No; unlike porcelain berry, some of these alternatives have showy flowers (e.g., *Lonicera* and *Clematis*).	If Yes, go to Box 10 If No, go to Question E

Box	Question	Answer	Outcome (i.e., Go to box:?)
	E. Does the plant benefit Minnesota to a greater extent than the negative impacts identified at Box #8?	No; not a significant crop or source of income for growers in Minnesota and not widely planted in Minnesota landscapes; still, porcelain berry is considered attractive and unique and people are always interested in new and unique plants.	Go to Box 10
10	Should the plant species be enforced as a noxious weed to prevent introduction &/or dispersal; designate as prohibited or restricted?		
	A. Is the plant currently established in Minnesota?	Yes (see Box 6, Question A.)	Go to Question B
	B. Does the plant pose a serious human health threat?	No, but the fruits should probably be avoided; variously described as edible, mildly toxic, and poisonous and not poisonous, but no documented references of human poisoning have been found.	Go to Question C
	C. Can the plant be reliably eradicated (entire plant) or controlled (top growth only to prevent pollen dispersal and seed production as appropriate) on a statewide basis using existing practices and available resources?	Yes; species not yet documented as escaped in Minnesota; individual plants and populations can be controlled by hand pulling and systemic herbicides, or a combination of manual means and herbicides for larger infestations; systemic herbicides that have been used effectively include triclopyr (e.g., Garlon 3A and Garlon 4) and glyphosate (e.g., Roundup and Rodeo); foliar applications of triclopyr (2.5%) in the fall may be the most effective; bark and cut-stump treatments can also be effective. No; the ultimate answer to this question may depend on whether porcelain berry has the ability to reproduce by seed in Minnesota (no documentation found); if not, based on the fact that it hasn't yet escaped cultivation and become naturalized in Minnesota, it would seem that regulation as Restricted would be the best course of action.	**List as a Prohibited/Eradicate Noxious Weed** **List as a Restricted Noxious Weed**

Box	Question	Answer	Outcome (i.e., Go to box:?)
11	Should the plant species be allowed in Minnesota via a species-specific management plan; designate as specially regulated?		

Final Results of Risk Assessment			
	Review Entity	**Comments**	**Outcome**
	NWAC Listing Subcommittee	RA leads to Prohibited:Eradicate. NWAC may want to consider listing as Restricted.	List as a Restricted Noxious Weed
	NWAC Full-group		List as a Restricted Noxious Weed
	MDA Commissioner	List as Prohibited Eradicate	List as a Restricted Noxious Weed
	File #: **MDARA00038POBE_7_21_2014**		

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