

MN NWAC Risk Assessment Worksheet (04-2011)	Common Name	<i>Latin Name</i>
	Amur maple	<i>Acer ginnala Maxim., syn Acer tataricum ssp. ginnala</i>
Reviewer	Affiliation/Organization	Date (mm/dd/yyyy)
Laura Van Riper, Tim Power	MN Department of Natural Resources, MN Nursery and Landscape Association	09/17/2015

Box	Question	Answer	Outcome
1	Is the plant species or genotype non-native?	Yes. Amur maple is native to Asia.	Go to Box 3
3	Is the plant species, or a related species, documented as being a problem elsewhere?	Yes. Regulated as a Restricted Invasive Species In Wisconsin (all cultivars exempt) (http://dnr.wi.gov/topic/Invasives/fact/AmurMaple.html). Ranked as moderately invasive in New York (http://www.nyis.info/user_uploads/4a6d0_1db2a_Acer.ginnala.NYS.pdf). Listed on Illinois Departments of Natural Resources Exotic Species webpages (http://dnr.state.il.us/education/exoticspecies/amurmaple.htm). NatureServe I rank of Medium/Insignificant (http://explorer.natureserve.org/servlet/NatureServe?searchName=Acer+ginnala). Listed as potentially invasive, but not banned in Connecticut (http://plants.usda.gov/java/noxious?rptType=State&statefips=09 , http://cipwg.uconn.edu/invasive_plant_list/).	Go to Box 6
6	Does the plant species have the capacity to establish and survive in Minnesota?	Yes.	Go to Box 7

Box	Question	Answer	Outcome
	A. Is the plant, or a close relative, currently established in Minnesota?	Yes. Amur maple has been widely planted in Minnesota. EDDMaps reports Amur maple as present in 42 counties in Minnesota, especially in the northeastern part of the state (http://eddmmaps.org/distribution/uscounty.cfm?sub=3965). MN Department of Natural Resources has 541 records of Amur maple on state lands.	Go to Box 7
7	Does the plant species have the potential to reproduce and spread in Minnesota?	Yes.	
	A. Does the plant reproduce by asexual/vegetative means?	No.	Go to 7C
	C. Does the plant produce large amounts of viable, cold-hardy seeds?	Yes. Plants can produce 5,000 or more fruits per year (each fruit has two seeds) and seeds require stratification to germinate (Ma and Moore 2008, Wisconsin 2011).	Go to 7F
	E. Is this species self-fertile?	<i>Amur maple is monoecious and is likely self-fertile (personal communication, Kevin Johnston, Bailey Nurseries Director of MN Production, 9 July 2015).</i>	<i>This text is provided as additional information not directed through the decision tree process for this particular risk assessment.</i>
	F. Are sexual propagules – viable seeds – effectively dispersed to new areas?	Yes. The fruits are winged samaras and are typically borne in pairs. While most of the seeds land within 100m of the parent tree, a portion could be carried long distances by wind and water (Oliver 2004, Ma and Moore 2008).	Go to 7I

Box	Question	Answer	Outcome
	<p>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?</p>	<p><i>Not known to hybridize (Wisconsin 2011). The horticultural species Acer ginnala and A. tataricum are closely related though geographically separated in their native ranges of NE Asia and SW Asia/Europe, respectively. However, none of the cultivars of either species currently available in the nursery trade is listed as a hybrid (personal communication, Tim Power, 6 July 2015).</i></p> <p><i>Some botanists classify Acer ginnala as a subspecies of Acer tataricum (Acer tataricum ssp. ginnala). Maples sold commercially as Acer ginnala often exhibit intermediate characteristics between these two species and may be hybrids between Acer ginnala and Acer tataricum (Herman et al. 2015).</i></p>	<p><i>This text is provided as additional information not directed through the decision tree process for this particular risk assessment.</i></p>
	<p>H. If the species is a 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?</p>	<p><i>Juvenile period is 3 years or less (personal communication, Kevin Johnston, 9 July 2015).</i></p>	<p><i>This text is provided as additional information not directed through the decision tree process for this particular risk assessment.</i></p>

Box	Question	Answer	Outcome
	I. Do natural controls exist, species native to Minnesota, that are documented to effectively prevent the spread of the plant in question?	<p>No.</p> <p>The Wisconsin (2011) risk assessment states “pests and pathogens of <i>A. ginnala</i> include: yellow-bellied sapsucker (<i>Sphyrapicus varius</i>); bacterial disease including crown gall (<i>Agrobacterium tumefaciens</i>); and fungal disease including <i>Anthracnose</i>, <i>Phytophthora</i> spp. basal rot and root rot, <i>Verticillium</i> wilt, and wood rots and decays. No species-specific pathogens have been identified.” There is no documentation that these controls prevent the spread.</p> <p><i>Verticillium</i> wilt caused by the fungus <i>Verticillium dahliae</i> can be a significant disease problem in nursery field production of Amur maple, but is unlikely to provide any natural control except in the nursery or in the managed landscape, in locations where Amur maple is planted on sites previously occupied by trees affected by <i>Verticillium</i> wilt. <i>Verticillium</i> overwinters in the soil as microsclerotia that can persist in well-drained soils for 10+ years (University of Minnesota Extension 2013).</p>	Go to Box 8
8	Does the plant species pose significant human or livestock concerns or has 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?	<p>No. No reports found. It has been found that other maple species, such as red maple (<i>Acer rubrum</i>) are toxic to horses when horses eat the wilted leaves. The University of Minnesota’s Extension program on horses classifies the wilted leaves of all maples as toxic (http://www.extension.umn.edu/agriculture/horse/pasture/maple/, personal communication Krishona Martinson, University of Minnesota, 2 June 2015).</p>	Go to 8B

Box	Question	Answer	Outcome
	B. Does, or could, the plant cause significant financial losses associated with decreased yields, reduced crop quality, or increased production costs?	No. No reports found.	Go to 8C
	C. Can the plant aggressively displace native species through competition (including allelopathic effects)?	Yes. Amur maple is “shade-tolerant and can shade out understory species in forests or herbaceous species in grasslands” (Wisconsin 2011). Allelopathic chemicals have been found in Amur maple (Cawly et al. 2005 cited by Wisconsin 2011).	Go to Box 9 Or if no, go to 8D
	D. Can the plant hybridize with native species resulting in a modified gene pool and potentially negative impacts on native populations?	<i>No. No reports found.</i>	<i>This text is provided as additional information not directed through the decision tree process for this particular risk assessment.</i>
	E. Does the plant have the potential to change native ecosystems (adds a vegetative layer, affects ground or surface water levels, etc.)?	<i>Yes. Can add a shrub layer to a prairie/grassland or an open woodland (Ma and Moore 2008, Wisconsin 2011).</i>	<i>This text is provided as additional information not directed through the decision tree process for this particular risk assessment.</i>
	F. Does the plant have the potential to introduce or harbor another pest or serve as an alternate host?	<i>No. No reports found.</i>	<i>This text is provided as additional information not directed through the decision tree process for this particular risk assessment.</i>
9	Does the plant species have clearly defined benefits that outweigh associated negative impacts?		

Box	Question	Answer	Outcome
	A. Is the plant currently being used or produced and/or sold in Minnesota or native to Minnesota?	<p>Yes. At least 9 Minnesota Soil and Water Conservation Districts are selling Amur maple (Kerry Saxton pers. comm. 15 June 2015).</p> <p>Amur maple has been sold by the nursery industry in Minnesota since its introduction to the state between 1900 and 1930 at the L. L. May Nursery in Afton and Bailey Nurseries in St. Paul (personal communication, Afton Historical Society, 2011). The following forms and cultivars are commonly available in Minnesota, typically sold bare-root or container-grown for their excellent fall color and red samaras and their suitability in a variety of soils, including disturbed urban soils:</p> <ul style="list-style-type: none"> • Species – grown in both shrub- and tree-form • ‘Flame’ – often grown shrub-form; orange-red to red fall color • ‘Embers’ – tree-form, showy red samaras and red fall color • ‘Bailey Compact’ - shrub-form, finer-textured, 8’ x 8’ • ‘Emerald Elf’ – shrub-form, 5’ x 5’ • ‘Red Wing’ – showy red samaras and red fall color <p>Bailey Nurseries cited national 2014 sales of 14,000+ Amur maple plants. (Personal communication Tim Power 6 July 2015)</p>	Go to 9B
	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?	<p>Yes. Amur maple is an introduced species. Oliver (2004) states “the Amur maple is easily controlled by cutting and treating the stumps with glyphosate herbicide. Apparently the shoots may resprout, but do not form roots. This species can also be removed by use of fire, which is useful in prairie habitats.”</p>	<p>If yes, then go to Box 11</p> <p>If no, then go to 9C</p>
	C. Is the plant native to Minnesota?	No. Amur maple is native to Asia.	Go to 9D

Box	Question	Answer	Outcome
	<p>D. Is a non-invasive, alternative plant material commercially available that could serve the same purpose as the plant of concern?</p>	<p>Native Substitutes on MN Department of Natural Resources Amur maple web page (http://www.dnr.state.mn.us/invasives/terrestrialplants/wooddy/amurmaple.html):</p> <ul style="list-style-type: none"> • Mountain maple (<i>Acer spicatum</i>) • American hornbeam (<i>Carpinus caroliniana</i> ssp. <i>virginiana</i>) • Pagoda dogwood (<i>Cornus alternifolia</i>) • Fireberry hawthorn (<i>Crataegus chrysocarpa</i>) • Pin Cherry (<i>Prunus pensylvanica</i>); requires well-drained, acid soil • Nannyberry (<i>Viburnum lentago</i>) • High-bush cranberry (<i>Viburnum trilobum</i>) <p>Non-invasive substitutes from Dan Shaw of the MN Board of Water and Soil Resources (pers. comm. 1 June 2015):</p> <ul style="list-style-type: none"> • Saskatoon Serviceberry (<i>Amelanchier alnifolia</i>) (mostly western MN) • Smooth Serviceberry (<i>Amelanchier laevis</i>) • American Hazelnut (<i>Corylus americana</i>) • Ninebark (<i>Physocarpus opulifolius</i>) • American Wild Plum (<i>Prunus pensylvanica</i>) • Choke cherry (<i>Prunus virginiana</i>) • Smooth Sumac (<i>Rhus glabra</i>) • Red Berried Elder (<i>Sambucus racemosa</i>) • Showy Mountain Ash (<i>Sorbus decora</i>) (mostly northern MN) <p>However, there is no understory maple that will thrive in urban soils in Minnesota other than <i>Acer ginnala</i> and <i>A. tataricum</i>.</p>	<p>If yes, then go to Box 10</p> <p>If no, then go to 9E</p>

Box	Question	Answer	Outcome
	E. Does the plant benefit Minnesota to a greater extent than the negative impacts identified at Box #8?	Opinions will vary on this question. Amur maple fills a role as a small urban tree. People will disagree as to whether the substitutes are acceptable. Benefits of this plant are economic benefits to those who sell it and the aesthetic benefits to those that plant it. The ecological impacts of Amur maple have not been thoroughly studied. The listing subcommittee recommends answering “yes” to this question.	If yes, then go to Box 11 If no, then 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. Amur maple has been widely planted in Minnesota. EDDMaps reports Amur maple as present in 42 counties in Minnesota, especially in the northeastern part of the state (http://eddmmaps.org/distribution/uscounty.cfm?sub=3965).	Go to 10B
	B. Does the plant pose a serious human health threat?	No. No reports found.	Go to 10C
	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?	Like other woody invasive species, the plant can be killed by cutting and applying herbicide. Amur maple is widespread in Minnesota. Amur maple is present in many people’s planted landscapes. Listing as a prohibited noxious weed is not appropriate.	

Box	Question	Answer	Outcome
11	Should the plant species be allowed in Minnesota via a species-specific management plan; designate as specially regulated?	<p>Wisconsin restricted the species from sale beginning in 2015, but allowed sale of all cultivars.</p> <p>Amur maple is the only shrub-form understory maple that is appropriately hardy and adaptable to plant in Minnesota's compacted urban soils. Since the invasion risk with Amur maple is based on the spread of seeds, an effective management strategy is to control seedlings by mowing. Amur maple seeds are spread primarily by wind, not by birds or other animals, so the risk of invasion drops dramatically as distance increases from a parent plant.</p> <p>Sales of Amur maple and its cultivars should be allowed to continue in Minnesota, with the caveat that plant sellers advise buyers that Amur maple should be planted only in managed landscapes where seedlings will be controlled by mowing or other methods. Amur maple should not be planted near natural areas, including prairie, savanna and upland forest ecosystems, in Minnesota.</p>	List as a Specially Regulated Plant with sellers affixing a label that advises buyers to only plant Amur maple and its cultivars in landscapes where the seedlings will be controlled by mowing or other means. Amur maple should be planted at least 100 yards from natural areas.
Final Results of Risk Assessment			
	Review Entity	Comments	Outcome

Box	Question	Answer	Outcome
	NWAC Listing Subcommittee	Recommend Specially Regulated Plant. The regulation would read as follows: <i>Any person, corporation, business or other retail entity distributing Amur maple or its cultivars for sale within the state, must have information directly affixed to the plant or container packaging that it is being sold with, stating the following: “Amur maple should only be planted in areas where the seedlings will be controlled or eradicated by mowing or other means. Amur maple should not be planted closer than 100 yards from natural areas.”</i>	Specially Regulated Plant with labeling information.
	NWAC Full-group	11 in favor and 0 opposed.	REGULATE. LIST AS A SPECIALLY REGULATED PLANT WITH THE AGREED REGULATION.
	MDA Commissioner	Approved NWAC Recommendation	REGULATE. LIST AS A SPECIALLY REGULATED PLANT WITH THE AGREED REGULATION.
	FILE # AmurMaple_2015_MDARA00056AMAP		

References:

Cawly, J., Newton, S. and M. Bolyard. 2005. Allelopathic activity of a testa-derived solution from Siberian maple (*Acer ginnala* Maxim.) seeds. *Allelopathy Journal* 16(2): 227-238.

Herman, D.E., C.M. Stange, and V.C. Quam (eds). 2015 *North Dakota Tree Handbook*. [Online] North Dakota State University. <https://www.ag.ndsu.edu/trees/handbook.htm>; <https://www.ag.ndsu.edu/trees/handbook/th-3-87.pdf> [8-13-2015].

Ma, J. and G. Moore. 2008. New York non-native plant Invasiveness ranking form: *Acer ginnala*
[Online] http://www.nyis.info/user_uploads/4a6d0_1db2a_Acer.ginnala.NYS.pdf [5-14-2015].

Oliver, L. 2004. *Acer ginnala*. U.S. Invasive Species Impact Rank (I-Rank). NatureServe Explorer. [Online]
<http://explorer.natureserve.org/servlet/NatureServe?searchName=Acer+ginnala> [5-14-2015].

Wisconsin Department of Natural Resources. 2011. *Acer ginnala* Literature Review.
[Online] http://dnr.wi.gov/topic/Invasives/documents/classification/LR_Acer_tataricum.pdf [5-14-2015].

University of Minnesota Extension. 2013. Verticillium Wilt of Trees and Shrubs. Listed at <http://cues.cfans.umn.edu/old/edlist.htm> [8-3-2015].