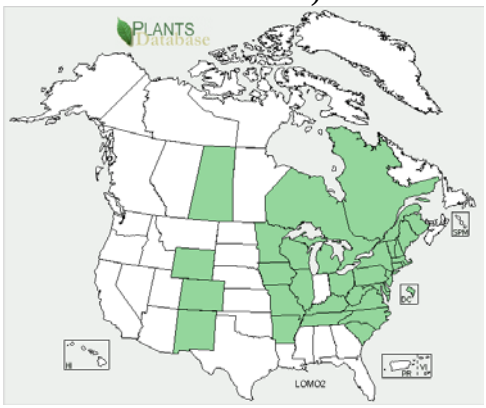
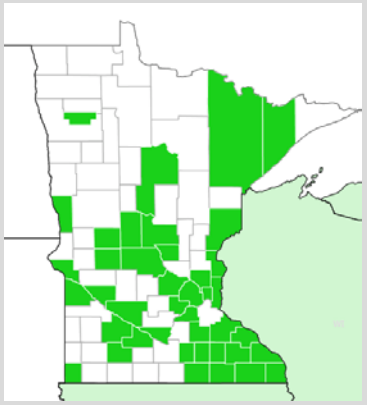
MN NWAC Risk Assessment Worksheet (04-2011)	Common Name	*Latin Name*
	**Morrow's honeysuckle**	***Lonicera morrowii***
Reviewer	**Affiliation/Organization**	**Date (mm/dd/yyyy)**
Laura Van Riper	**Minnesota Department of Natural Resources**	**08/28/2014**
Tim Power	**Minnesota Nursery and Landscape Association**	

Box	Question	Answer	Outcome
1	Is the plant species or genotype non-native?	Yes. Native to Japan. (Munger 2005)	Go to Box 3.

Box	Question	Answer	Outcome
3	Is the plant species, or a related species, documented as being a problem elsewhere?	Yes. Naturalized in states in the eastern and midwest United States (Love et al. 2009, McCusker et al. 2010, Wisconsin Department of Natural Resources 2007).  Regulated as noxious/invasive in CT, MA, NH, and VT. USDA Plants accessed 3-26-14. http://plants.usda.gov/core/profile?symbol=LOMO2 Restricted in Wisconsin NR40.	Go to Box 6.
6	Does the plant species have the capacity to establish and survive in Minnesota?		

Box	Question	Answer	Outcome
	A. Is the plant, or a close relative, currently established in Minnesota?	Yes.  Morrow's honeysuckle has been found in many counties in Minnesota, especially in the southeast and central portions of the state (EDDMaps 2014). There are not many reports in the northwest portion of the state and limited reports in the southwest.	Go to Box 7.
	B. Has the plant become established in areas having a climate and growing conditions similar to those found in Minnesota?		
7	Does the plant species have the potential to reproduce and spread in Minnesota?		
	A. Does the plant reproduce by asexual/vegetative means?	"Research on asexual reproduction for the bush honeysuckles is sparse. In the commercial trade greenwood and hardwood cuttings are used to propagate stocks of bush honeysuckles." from Wisconsin DNR 2007.	Go to Box 7B.
	B. Are the asexual propagules effectively dispersed to new areas?	Not likely. The main method of spread to new sites is likely through seeds.	Go to Box 7C.
	C. Does the plant produce large amounts of viable, cold-hardy seeds?	"Information about seed production is sparse, but it is apparent that some bush honeysuckles are capable of producing substantial numbers of seeds. Barnes indicates Bell's honeysuckle produces consistent annual seed crops. A single "typical" Bell's honeysuckle shrub, about 6.6 feet (2 m) tall, growing in southern Wisconsin, produced 3,554 berries in 1 year. Numbers of seeds/fruit, sampled from several shrubs at this site, averaged 5 to 7, indicating that a "typical" plant may produce >20,000 seeds annually." from Munger 2005. *L. morrowii* is a parent plant of Bell's honeysuckle.	Go to Box 7F.

Box	Question	Answer	Outcome
	D. If this 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?		
	E. Is this species self-fertile?	***Not known (Munger 2005).***	***Blue text is provided as additional information not directed through the decision tree process for this particular risk assessment.***
	F. Are sexual propagules – viable seeds – effectively dispersed to new areas?	Yes. Birds can vector honeysuckle fruits and seeds (Drummond 2005, McCusker et al. 2010).	Go to Box 7I
	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?	***Yes. L. morrowii has hybridized with the non-native L. tatarica to form the hybrid L. x bella which is widely distributed in Minnesota. Other hybrids have been formed although they are not widely escaped:*** ***Lonicera × minutiflora Zabel (bunchberry honeysuckle), a cross between L. morrowii and L.× xylosteoides.*** ***Lonicera × muscaviensis Rehd. (Muscovy honeysuckle), a cross between L. morrowii and L. ruprechtiana. (Munger 2005)***	***Blue text is provided as additional information not directed through the decision tree process for this particular risk assessment.***
	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?		

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?	No controls native to Minnesota exist. "Although not purposely introduced for the purposes of biological control, *Hyadaphis tataricae* is a nonnative aphid that feeds on a variety of bush honeysuckles in North America (for an analysis of taxa-specific susceptibility see Herman and Chaput [72]) [183,184]. *H. tataricae* feeding results in dwarfing and folding of terminal leaves, stunted terminal growth, and development of "witches brooms" [23,24,107,183]. This lowers plant vigor and may prevent flowering and fruit development [23,24,184]. Voegtlin and Stoetzel [184] indicate that it is not expected to provide widespread, effective control of bush honeysuckles. However, according to U.S. Geological Survey Northern Prairie Wildlife Research Center [23,24], *H. tataricae* is still expanding its North American range and "may eventually reach levels that will provide control." from Munger 2005. There is a honeysuckle leaf blight that has been observed on Morrow's honeysuckle in Iowa, Ohio, and Pennsylvania (Boyce et. al 2014).	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?	Yes.	
	A. Does the plant have toxic qualities, or other detrimental qualities, that pose a significant risk to livestock, wildlife, or people?	Not known. Dense infestations of the related Amur honeysuckle can increase the incidence of tick borne diseases to humans (Allan et al. 2005).	Go to 8B.
	B. Does, or could, the plant cause significant financial losses associated with decreased yields, reduced crop quality, or increased production costs?	High densities of honeysuckles may constrain timber regeneration which could have negative financial impacts for the timber industry (e.g. Schulte et al. 2011).	Go to Box 9.
	C. Can the plant aggressively displace native species through competition (including allelopathic effects)?	***Can reach high densities, for example density of Morrow's honeysuckle was 67,920 ± 4,480 shrubs/ha in a study in Pennsylvania (Love and Anderson 2009).*** ***There are reports of dense stands of non-native honeysuckles forming monocultures in forest understories (Batcher and Stiles 2000, Munger 2005, Webster et al. 2006, Wisconsin DNR 2007, NatureServe 2014).***	***Blue text is provided as additional information not directed through the decision tree process for this particular risk assessment.***

Box	Question	Answer	Outcome
	D. Can the plant hybridize with native species resulting in a modified gene pool and potentially negative impacts on native populations?	***No hybridization with native species known.***	***Blue text is provided as additional information not directed through the decision tree process for this particular risk assessment.***
	E. Does the plant have the potential to change native ecosystems (adds a vegetative layer, affects ground or surface water levels, etc.)?	***Adds a shrub layer (Munger 2005).***	***Blue text is provided as additional information not directed through the decision tree process for this particular risk assessment.***
	F. Does the plant have the potential to introduce or harbor another pest or serve as an alternate host?	***No evidence of this.***	***Blue text is provided as additional information not directed through the decision tree process for this particular risk assessment.***
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?	Not aware of any Minnesota nurseries producing Morrow's honeysuckle for sale. There are nurseries selling the similar looking *L. tatarica* cultivars. (Tim Power, Minnesota Nursery and Landscape Association, May 12, 2014). Plant is not native to Minnesota.	Go to Box 10.
	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?	***The plant is an introduced species. Its spread cannot be easily controlled. It produces abundant seeds which can be vectored by birds. It is a woody plant so control is cost and labor intensive.***	***Blue text is provided as additional information not directed through the decision tree process for this particular risk assessment.***
	C. Is the plant native to Minnesota?	***No.***	***Blue text is provided as additional information not directed through the decision tree process for this particular risk assessment.***

Box	Question	Answer	Outcome
	D. Is a non-invasive, alternative plant material commercially available that could serve the same purpose as the plant of concern?	***Yes.*** ***There are native honeysuckles than can be alternatives: Diervilla lonicera [dwarf bush honeysuckle; note this is not a true honeysuckle (Lonicera)], Lonicera canadensis (fly honeysuckle), L. oblongifolia (swamp fly honeysuckle), L. villosa (mountain fly honeysuckle); the three true honeysuckles (Lonicera sp.) are not commonly grown commercially.*** ***There are ornamental non-native honeysuckles (Lonicera xylosteum cultivars) sold that have not had their invasive potential assessed.*** ***Alternatives listed in MIPN Landscape Alternatives brochure (note that not all are hardy in Minnesota) (http://mipn.org/MIPN%20Landscape%20Alternatives%202013.pdf): Amelanchier spp. (serviceberry), Heptacodium miconioides (seven son flower), Kolkwitzia amabilis (beautybush), Calycanthus floridus (Carolina allspice), Sambucus canadensis (American elderberry), Sambucus pubens (American red elderberry), Lonicera dioica (red honeysuckle), Lonicera involucrata (twinberry), Stephanandra incise (cultleaf stephanandra)*** ***Viburnums (Viburnum spp. – V. acerifolium, V. lentago, V. rafinesquianum, V. trilobum), the ninebarks (Physocarpus opulifolius), and the dogwoods (Cornus spp. – C. alternifolia, C. racemosa, C. sericea) can also be alternatives.***	***Blue text is provided as additional information not directed through the decision tree process for this particular risk assessment.***
	E. Does the plant benefit Minnesota to a greater extent than the negative impacts identified at Box #8?		
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.	Go to Box 10B.

Box	Question	Answer	Outcome
	B. Does the plant pose a serious human health threat?	No.	Go to Box 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?	No. There are methods that can be used to control Morrow's honeysuckle, but they are cost and labor intensive. Morrow's honeysuckle is widespread on a statewide basis. The plant likely cannot be reliably controlled on a statewide basis using existing practices and available resources. Control of Morrow's honeysuckle is cost and labor intensive. Love and Anderson (2009) reported costs including: $770/ha (for foliar herbicide treatments), $4880/ha (for cutting plants), $9330/ha (mechanical removal with an axe), and $9620/ha (for cutting plants and treating the stump with herbicide). Love and Anderson's (2009) implications for practice were: • Mechanical removal in spring was most effective, and a foliar application of 2% glyphosate solution in spring was the second most effective method to reduce density of Morrow's honeysuckle. • Foliar application of 2% glyphosate was the cheapest treatment method and required the least amount of labor. • Mechanical removal of Morrow's honeysuckle resulted in the highest metrics for herbaceous diversity. • Shrub density, rather than percent shrub cover or stem density, proved to be the most reliable indicator of treatment success. • An adaptive restoration approach, including follow-up treatments, planting of native seedlings and herbs, and deer control, will need to be enacted to meet restoration goals.	List as a Restricted Noxious Weed.
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	Subcommittee agreed with the risk assessment that *L. morrowii* should be listed as a restricted noxious weed.	List as a Restricted Noxious Weed.
	NWAC Full-group		Restricted Noxious Weed
	MDA Commissioner	Approved NWAC Recommendation	Restricted Noxious Weed
	File #: **MDARA00033MOHS_8_28_2014**		

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