



Michigan Invasive Plant Council

Michigan Plant Invasiveness Assessment System (MPIAS June 2008)

Genus, Species, Species subset

Scientific Name:	Lonicera x bella		
Synonyms:	The result of crosses between L. morrowii and L. tatarica (Dirr, M. 1998. Manual of Woody Landscape Plants. p. 576.). The hybrid is listed in some manuals as Lonicera bells Zabel.		
Common Names(s):	Belle Honeysuckle, Bell' s Honeysuckle, Bella Honeysuckle, Pretty Honeysuckle, Showy Bush Honeysuckle		
Plant Type:	<input type="checkbox"/> Annual	<input type="checkbox"/> Biennial	<input checked="" type="checkbox"/> Perennial

The information within this MPIAS assessment is specific to the plant listed and does not imply that cultivars, varieties, other species subsets and hybrids exhibit the same behavior or scoring.

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USDA/APHIS – Federal Noxious Weed List	http://www.aphis.usda.gov/ppq/permits/fnwsbycat-e.PDF
Michigan Department of Agriculture – Noxious, Prohibited, and Restricted Plants	http://www.michigan.gov/mda/0,1607,7-125-1569_16993-11250--00.html

Federal and Michigan Noxious, Prohibited, or Restricted Plants

Is this species listed on the federal or Michigan noxious, prohibited, or restricted plant lists?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
If YES then do not proceed with assessment but indicate its federal and/or Michigan Department of		

Agriculture status on the front of the response form

If **NO** then go to Section I

Section I: Biological Character

Biological characteristics: Reproductive Ability and Dispersal. Reproductive characteristics and dispersal ability strongly relate to the potential of a plant to become invasive. The results of this section will be used by MIPC to calculate a rank of Potential Invasiveness in Section VII. *Check those that apply to this plant and note any other weedy or invasive traits this plant possesses in the space for comments below:*

I – A Reproductive Ability

Reproductive ability identifies a plant's invasive tendency in Michigan as high (H), medium (M), low (L), insignificant (I) or none (N) based on seed and vegetative reproductive characteristics.

Plant Type:	<input type="checkbox"/> Annual	<input type="checkbox"/> Biennial	<input checked="" type="checkbox"/> Perennial
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I – A1. Reproduction by Seed

If the plant is sterile or unable to complete a reproductive cycle in Michigan, skip the following questions and enter an N in the Seed Subrank at the end of this section.

<input checked="" type="checkbox"/>	Reproduces readily by seed.
<input checked="" type="checkbox"/>	When it produces seed, produces over 1,000 seeds per square meter
<input checked="" type="checkbox"/>	Reproduces at least once per year
<input checked="" type="checkbox"/>	Can germinate in a wide range of conditions
<input type="checkbox"/>	Seeds remain viable in the soil for 2 years or more.

Seed rating:	1 box marked = I 2 boxes marked = L 3 boxes marked =M 4 - 5 boxes marked = H
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Seed Subrank

Enter the Seed Subrank in the appropriate blank at the end of Section I – A.	Rank
I – A1. Reproduction by Seed:	H

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input checked="" type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level: 16. Reproductive Characteristics:High significance Comments: Lonicera tatarica grows rapidly and produces large quantities of showy, bird-dispersed			

berries (Woods, 1993). The species also produces abundant annual seed crops as reproduction is primarily by seed although greenwood and hardwood cuttings have been used extensively in commercial propagation (Batcher and Stiles, 2000). Crosses may have similar characters, although *Lonicera x bella* also reproduces asexually by root suckering and layering (Barnes, 1972 in Munger, 2005) which also may occur in either parent. A typical plant of *Lonicera x bella* may produce > 20,000 seeds annually (Munger, 2005). (www.natureserve.org)

Reproduction is almost entirely by seed. Seed production and short-term seed viability are consistently high. They grow in soils ranging from poorly to well drained and non-calcareous to limey. . . (Batcher, MS and Stiles, SA. 2000. Element stewardship abstract for *L. maackii*, *L. morrowii*, *L. tatarica*, *L. x bella*: the bush honeysuckles. The Nature Conservancy)

The hybrid occurs over conditions that, in most cases, includes the ranges of both parents. Locally, *L. x bella* is found in the complete range of moisture and soil types that exist in the area. In the University of Wisconsin Arboretum it appears to do best in marshland, but is the major component of the understory of disturbed forests, and also occurs on dry, sandy hillsides. (Barnes, WJ and Cottam, G. 1974. Some autecological studies of the *Lonicera x bella* complex. *Ecology* 55:40-50)

Barnes [7] 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 [7]. It appears the potential for bush honeysuckles to form seed banks is low, but more research is needed to confirm this assertion and to determine interspecific differences.

Bell's honeysuckle shrubs may also produce fruit at as young as 3 years of age [7].

According to Barnes [7] Bell's honeysuckle germination is epigeal [a mode of seed germination in which the cotyledons are carried above the soil on the axis or hypocotyl (Allaby 1992).]

Seeds of Tatarian honeysuckle, Morrow's honeysuckle, Bell's honeysuckle, and Amur honeysuckle remain germinable following passage through the guts of white-tailed deer. Vellend [180] measured 76% germination for seeds collected from deer feces, compared with 81% for fresh-collected seeds.

Mature Bell's honeysuckle shrubs were found growing over a variety of soils at the University of Wisconsin Madison Arboretum including: a) a droughty, infertile, loamy sand, b) a well- to moderately well drained, moderately fertile, silt loam, c) an imperfectly- to poorly drained silt loam, and d) a muck soil where the water table was at or near the surface in spring [7]. (Munger, Gregory T. 2005. *Lonicera* spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2007, June 4].)

I – A2. Reproduction by Vegetative Means

If the plant does not reproduce vegetatively in Michigan, skip the following questions and enter an N in the Vegetative Subrank at the end of this section.

<input type="checkbox"/>	Reproduces readily <i>in situ</i> by vegetative means
<input type="checkbox"/>	Has spreading rhizomes that may root at nodes.
<input type="checkbox"/>	Fragments easily with fragments readily becoming re-established long distances from the parent plant by natural means (if checked, rating is automatically marked as high)
<input checked="" type="checkbox"/>	Other (*please discuss in comments and provide documentation)

Vegetative rating:	1 box marked = I 2 boxes marked = L 3 boxes marked =M 4 boxes marked = H
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Vegetative Subrank

Enter the Vegetative Subrank in the appropriate blank at the end of	Rank
Section I – A Vegetative:	I

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input checked="" type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
<p>Comments, supportive evidence, and explanation of documentation level:</p> <p>Any portions of the root system not removed can resprout (Tennessee Exotic Pest Plant Council 1997). Winter clipping should be avoided as it encourages vigorous re-sprouting (Virginia Natural Heritage Program, no date). (Batcher, MS and Stiles, SA. 2000. Element stewardship abstract for <i>L. maackii</i>, <i>L. morrowii</i>, <i>L. tatarica</i>, <i>L. x bella</i>: the bush honeysuckles. The Nature Conservancy)</p> <p>Bush honeysuckles readily resprout following prescribed burning. Resprouting will occur if all of the root is not removed during hand-pulling. Some resprouting may also occur following herbicide application. (Nybour, R. 1992. Illinois Department of Conservation. Written for the Illinois Nature Preserves Commission. www.inhs.uiuc.edu/chf/outreach/VMG/bhnysckl.html)</p> <p>Bush honeysuckles regenerate from seeds, as well as vegetatively following disturbance.</p> <p>Bell's honeysuckle reproduces asexually by root suckering and layering [7]. Barnes [7] studied root suckering and layering in 4 populations of Bell's honeysuckle in Wisconsin. Between 4 and 7% of shrubs sampled exhibited suckers. Suckers were encountered primarily on small shrubs, and those found on</p>			

large, mature plants were usually within 2 to 3 feet (60-90 cm) of the root crown. Frequency of layering was estimated by examining all branches of sampled shrubs in contact with the soil surface for evidence of root development. Layering frequency varied between sites, with 1 site having 3% of shrubs showing evidence of layering, 2 sites having 9%, and a 4th site 19%. Layering frequency appeared to be positively related to soil moisture and duration of contact between branch and soil, although there were no supporting data. Barnes [7] also indicated that suckering and layering occurred most frequently on sites where Bell's honeysuckle seedling establishment was poorest.

(Munger, Gregory T. 2005. *Lonicera* spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2007, June 4].)

I-A3. Growth Habit

Growth Habit	Large rounded shrub 8-10' high and 12' wide with arching branches (Dirr, M. 1998. <i>Manual of Woody Landscape Plants</i>)
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I – B. Dispersal:

Dispersal identifies the vectors or agents of dispersal and the likelihood of long distance dispersal.

Dispersal agents	(E) Environmental Influences such as wind and water (W) Wildlife, both mammals and birds (DA) Domestic Animals, both mammals and birds (H).Human activity Dispersal distance refers to the potential for long distance dispersal.
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Dispersal distance refers to the potential for long distance dispersal.

I-B1. Vector categories

Identify the vector categories and individual agents involved with the dispersal of this plant. Check all that apply	
<input type="checkbox"/> Environmental Influences (E):	<input type="checkbox"/> Wind <input type="checkbox"/> Water <input type="checkbox"/> Other (name)
<input checked="" type="checkbox"/> Wildlife (W):	<input checked="" type="checkbox"/> Mammals <input checked="" type="checkbox"/> Birds <input type="checkbox"/> Other (name)
<input checked="" type="checkbox"/> Domestic Animals (DA):	<input checked="" type="checkbox"/> Mammals <input checked="" type="checkbox"/> Birds <input type="checkbox"/> Other (name)
<input checked="" type="checkbox"/> Human Activity (H):	<input type="checkbox"/> New development (construction equipment) <input type="checkbox"/> Maintenance equipment <input type="checkbox"/> Borrow material (topsoil, gravel, stone) <input type="checkbox"/> Recreation (ATV, boats, RV) <input checked="" type="checkbox"/> Dumping <input checked="" type="checkbox"/> Other (name) ornamental and wildlife plantings
<input type="checkbox"/> Other (*please discuss in comments and provide documentation)	

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input checked="" type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
<p>Comments, supportive evidence, and explanation of documentation level:</p> <p>Seeds are readily dispersed by birds and, perhaps, small mammals. Lonicera spp. have been widely used in ornamental plantings. Commercial sources continue to introduce Lonicera species to areas not already colonized, but most future invasions will originate in naturalized populations of the shrubs. (Batcher, MS and Stiles, SA. 2000. Element stewardship abstract for L. maackii, L. morrowii, L. tatarica, L. x bella: the bush honeysuckles. The Nature Conservancy)</p> <p>Often the source of the invasion comes from a planting or from a highly disturbed successional community in which the honeysuckle has flourished (referring to Tartarian, Morrow' s, Belle and Amur honeysuckles). (Nybour, R. 1992. Vegetation Management Guideline. Illinois Department of Conservation. Written for the Illinois Nature Preserves Commission. www.inhs.uiuc.edu/chf/outreach/VMG/bhnysockl.html)</p>			

Some infestations have spread from horticultural plantings, wildlife habitat improvement plantings and erosion control plantings. (USDA Forest Service Weed of the Week; www.na.fs.fed.us/fhp/invasive_plants)

As recently as the 1980' s they were promoted for their wildlife values, ornamental use, and soil stabilization. (University of Maine Cooperative Extension, Bulletin #2507; Shrubby Honeysuckles; www.umext.maine.edu/onlinepubs/htmpubs/2507.htm)

This hybrid complex has been used to a considerable extent for landscape and ornamental purposes over much of the northern United States. It has also been used to a lesser extent in conservation planting, especially in shelterbelts in the prairie-plains region. It has escaped from these uses and now occupies a significant extent of territory. . . (Barnes, WJ and Cottam, G. 1974. Some autecological studies of the *Lonicera x bella* complex. *Ecology* 55:40-50)

Several sources indicate bush honeysuckle seeds are dispersed primarily by frugivorous birds [7,80,93,126,186]. White-tailed deer may also consume and disperse viable seeds of Tatarian honeysuckle, Morrow's honeysuckle, Bell's honeysuckle, and Amur honeysuckle [180]. Barnes [7] suggests that "many, if not most" fruits fall near the parent plant.

Bell's honeysuckle has been used for landscape and ornamental purposes in the northern U.S. [8].

(Munger, Gregory T. 2005. *Lonicera* spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2007, June 4].)

12. Long-distance Dispersal Potential within Nation:High significance

Comments: Dispersal is primarily by birds and some small mammals (Batcher and Stiles, 2000; Barnes and Cottam, 1974) that disperse the seeds. The plant has been used extensively in North America in shelter beds and wildlife planting (Woods, 1993; Barnes and Cottam, 1974). Migrant bird species favor the fruit and the plant is still sold for horticultural purposes (Batcher and Stiles, 2002; Nyboer, 1992: Williams, 2001). (www.natureserve.org)

Produces large quantities of bird-dispersed berries. [In this study, *L. tatarica* is not distinguished from *L. x bella*, a hybrid of *L. tatarica* and *L. morrowi*. Barnes (1972) concludes that the hybrid swarm is extensively distributed in the northeastern US so the populations studied here may be taxonomically complex.] (Woods, KD. 1993. Effects of invasion by *Lonicera tatarica* L. on herbs and tree seedlings in four New England forests. *American Midland Naturalist* 130:62-74)

I – B2. Dispersal Distance

<input type="checkbox"/>	Little potential for long-distance dispersal (1 km in a single dispersal event)
<input checked="" type="checkbox"/>	Great potential for long-distance dispersal

Please use this scale and your answers from Section I – B above to calculate a: Dispersal Subrank

Dispersal Subrank	I One or two vector categories; Little potential for long-distance dispersal
	L Three or four vector categories; Little potential for long-distance dispersal
	M One or two vector categories; Great potential for long-distance dispersal
	H Three or four vector categories; Great potential for long-distance dispersal

Dispersal Subrank

Section I B. Dispersal Subrank:	H
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Biological Character Subrank

Biological Character Subrank	Rank
Section I A. Reproductive Ability: Reproduction by Seed	H
Section I A. Reproductive Ability: Reproduction by Vegetative Means	I
Section I B. Dispersal:	H

Section II: Impact

Impact: Impact identifies the plant's ecological, aesthetic, economic influence on each of the respective natural, managed, and/or constructed system. Questions on impact are tailored to the individual characteristics and composition of the system. Impact is classified as high (H), medium (M), low (L), or insignificant (I).

II - A. Natural Systems

Impacts on native species and natural systems: Terrestrial and Aquatic. *Where possible, assess the cumulative (e.g., over a period of several decades) impact of the plant on the natural areas and other wildlands where it typically occurs. Impacts will be re-assessed as more is learned and as the plant moves into new areas.*

II - A1. Ability to invade natural systems

Choose one answer that best describes the ability of this plant to invade natural systems.	
<input type="checkbox"/>	Not known to spread into natural systems in the absence of disturbance (e.g. plant may persist from former cultivation) (0 points)
<input type="checkbox"/>	Establishes only in areas where major disturbance has occurred in the last 20 years (e.g., post-hurricane sites, highway corridors) (3 points)
<input type="checkbox"/>	Often establishes in mid-late-successional natural areas where minor disturbances may occur (e.g. tree falls, hiking trails, streambank erosion), but no major disturbance within the last 20-75 years (7 points)
<input checked="" type="checkbox"/>	Often establishes in intact or otherwise healthy natural systems with no major disturbance for at least 75 years (15 points)

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input checked="" type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level:			
S-2. Present in conservation areas or other native species habitat? Yes			
Comments: In many U.S. forests, previously open understories are now near-impenetrable masses of <i>Lonicera tatarica</i> , or the hybrid cross of <i>L. tartarica</i> and <i>Lonicera morrowi</i> , <i>Lonicera x bella</i> (Woods, 1993), although the hybrid swarm is most extensively distributed in the northeastern U.S. (www.natureserve.org)			
14. Inherent Ability to Invade Conservation Areas and Other Native Species Habitats:High significance			
Comments: This species is listed as an "invasive plant of major concern" in Czarapata (2005). <i>Lonicera x bella</i> competitive success may be due in part to hybrid vigor as both parent species are extremely successful invaders (Batcher and Stiles, 2000). Although primarily a plant of disturbance, <i>Lonicera x bella</i> has a tremendous amplitude of tolerance for temperature, soil moisture, soil type, and light; much more			

so than either of its parent species. It is often associated with woods including second growth woods or open woods (Barnes and Cottam, 1974). (www.natureserve.org)

Occupies a wide range of sites. Most often found on forest edges and in forest interiors but are also found in lacustrine (lakeside) and riparian habitats and in a variety of waste places such as abandoned agricultural land and road and railroad rights-of-way (Barnes 1974; Woods 1993). The bush honeysuckle group as a whole favors disturbed sites and forest edges or openings, but in a New England study of the *L. tatarica*-*L. morrowii*-*L. x bella* group, it also invaded the interior of intact forests (Woods 1993). The *L. tatarica*-*L. morrowii*-*L. x bella* complex is an aggressive invader of lower elevation forests throughout the northeastern US (Woods 1993). (Batcher, MS and Stiles, SA. 2000. Element stewardship abstract for *L. maackii*, *L. morrowii*, *L. tatarica*, *L. x bella*: the bush honeysuckles. The Nature Conservancy)

Often the source of the invasion comes from a planting or from a highly disturbed successional community in which the honeysuckle has flourished (referring to Tartarian, Morrow' s, Belle and Amur honeysuckles). Wetlands, prairie, and forested communities are all affected. Habitat disturbance appears to be a key to introduction of these species. (Nybour, R. 1992. Vegetation Management Guideline. Illinois Department of Conservation. Written for the Illinois Nature Preserves Commission. www.inhs.uiuc.edu/chf/outreach/VMG/bhnysockl.html)

Adapted to a variety of habitats, it thrives in sunny sites including open forests, forest edges, roadsides, pastures abandoned fields, fens, bogs, and lakeshores. It is relatively shade intolerant. (USDA Forest Service Weed of the Week; www.na.fs.fed.us/fhp/invasive_plants)

This honeysuckle has a wide amplitude of tolerance along environmental gradients, occurring in all of the 30 terrestrial plant communities present in the University of Wisconsin Arboretum.

Records taken from specimens in the University of Wisconsin Herbarium, show that 34% of the locations are from man-disturbed areas, and 23% are from naturally disturbed areas such as lake, river and streambank locations. Although the single largest number of records, 28%, are from woods or wooded areas, many of these were characterized as second growth woods or open woods, or the plant was said to be growing within openings or at the edge of the woods. The local evidence indicates that *L. x bella* is a plant of disturbance, but that it has a tremendous amplitude of tolerance for temperature, soil moisture, soil type, and light. Habitats of the *L. x bella* complex in North America: woodlands or wooded areas; lake, river or stream banks; roadsides; pastures or fields; swamps, marshes, or moist spots; bluffs, ridges, or cliffs; thickets; railroads; fencerows; wastelands. (Barnes, WJ and Cottam, G. 1974. Some autecological studies of the *Lonicera x bella* complex. *Ecology* 55:40-50)

Throughout many areas of North America, bush honeysuckles are considered invasive and a threat to native habitats and plant communities. They can escape, establish, and persist outside cultivation, and may continue to spread into adjacent areas [32,108,152,157]. Barton and others [11] examined abundance of nonnative woody and semiwoody plants in rural western Maine along transects

representing field edges, abandoned railroad right-of-way edges, roadsides, and riparian sites. Of 12 nonnative species measured, bush honeysuckles (Morrow's honeysuckle, Tatarian honeysuckle, and Bell's honeysuckle counted together) occurred along the greatest number of transects and had the 2nd greatest number of total patches and patches/km in the study.

Barnes [7] sampled Bell's honeysuckle seedling density and frequency at 4 sites in southern Wisconsin. The site with the highest seedling frequency (39%) was characterized as a red pine (*Pinus resinosa*)- and eastern white pine (*P. strobus*)-dominated overstory and a sparse understory. This site had a primarily pine straw litter layer of variable depth over sandy loam and loamy sand soils. Within this site, Bell's honeysuckle seedlings were found within microsites having little to no litter cover. The site with the greatest seedling density (5,280 seedlings acre⁻¹) contained a "very dense" population of mature Bell's honeysuckle shrubs, with near-continuous cover in some places. Observations indicate that at this site, seedlings occurred mainly under mature Bell's honeysuckle, where litter accumulation and herbaceous competition were sparse.

Two other sites each had only 1 and 2 Bell's honeysuckle seedlings total. Among reasons provided for the paucity of seedlings at these sites were lack of soil disturbance, a thick layer of leaf litter from the oak overstory, and strong herbaceous and vine competition. A subsample was obtained from another section within 1 of these seedling-poor sites, where a dense population of mature Bell's honeysuckle shrubs had been eradicated during the previous year. Because of eradication treatments, plant litter and herbaceous competition were sparse. Consistent with other observations, substantial numbers of seedlings (26% occurrence, 2,560 seedlings acre⁻¹) were found where litter cover and herbaceous competition were sparse and a seed source had been present [7].

In Michigan, Bell's honeysuckle is found in habitats similar to those of Tatarian honeysuckle and Morrow's honeysuckle [186]. In Michigan, Tatarian honeysuckle escapes to roadsides, railroads, thickets, lakeshores, riverbanks, woods, fields, "waste places" and swamps [186]. In lower Michigan, it (Morrow's honeysuckle) escapes to roadsides, railroads, thickets, lakeshores, riverbanks, and woods [186].

It appears that bush honeysuckle establishment is often facilitated by some form of habitat disturbance [152].

(Munger, Gregory T. 2005. *Lonicera* spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2007, June 4].)

Successful invader of intact, late-successional forests. It has become an aggressive invader of lower elevation forests throughout northeastern US, growing most densely along forest edges and in clearings, but also invading the interior of intact forests. [In this study, *L. tatarica* is not distinguished from *L. x bella*, a hybrid of *L. tatarica* and *L. morrowi*. Barnes (1972) concludes that the hybrid swarm is extensively distributed in the northeastern US so the populations studied here may be taxonomically complex.]

(Woods, KD. 1993. Effects of invasion by *Lonicera tatarica* L. on herbs and tree seedlings in four New England forests. *American Midland Naturalist* 130:62-74)

II - A2. Impact on Ecosystem Processes

Plants that alter processes such as fire occurrence or frequency, erosion, and sedimentation rates, hydrological regimes, or nutrient regimes often have the greatest long-term impacts on ecosystems. Some invaders can completely transform natural systems so that they can no longer support native species.

Choose one answer that best describes the impact of this plant on ecological processes:	
<input type="checkbox"/>	Not known impact on ecosystem processes (0 points)
<input type="checkbox"/>	Influences ecosystem processes (e.g., has perceivable but mild influence on soil nutrient availability) (5 points)
<input checked="" type="checkbox"/>	Significant alteration in ecosystem processes (e.g., increases sedimentation rates along coastlines, reducing open water areas that are important for waterfowl) (10 points)
<input type="checkbox"/>	Major, possibly irreversible, alteration or disruption of ecosystem processes (e.g., the plant reduces water level from open water or wetland systems through rapid transpiration, making these areas more fire prone and unable to support native wetland species; or plant fixes nitrogen in the soil making soil unlikely to support certain native plants) (15 points)

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input checked="" type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level:			
<p>1. Impact on Ecosystem Processes and System-wide Parameters:Medium/Low significance</p> <p>Comments: Suppression of advance regeneration of native tree seedlings reported by Woods (1993) in Vermont and Massachusetts by the parent species, <i>Lonicera tatarica</i>, would potentially lead to changes in canopy composition or even failure of canopy tree replacement resulting in conversion of forests to more open canopies and shrublands. (www.natureserve.org)</p> <p>It is likely that interference from dense bush honeysuckle populations can suppress advance regeneration of native tree seedlings. Woods [198] studied invasion of bush honeysuckles (in this study Tatarian honeysuckle and Bell's honeysuckle were not distinguished, although the text referred only to Tatarian honeysuckle (see Taxonomy)) in 3 sugar maple-dominated stands in Vermont, plus a red maple-dominated forest in northwestern Massachusetts. He found tree seedling (<1 m tall) density declined significantly ($p < 0.01$) with increasing Tatarian honeysuckle cover. Average seedling density at all sites was $>5 \text{ m}^{-2}$ where Tatarian honeysuckle was not present, but was $<1 \text{ m}^{-2}$ when Tatarian honeysuckle cover was $>90\%$. It was suggested that understory dominance by bush honeysuckles, as was observed, could ultimately alter successional patterns in forests typical to these. Even if seedlings of shade tolerant tree species can establish, interference from dense bush honeysuckle populations may still impact recruitment into mid-story or subcanopy status. (Munger, Gregory T. 2005. <i>Lonicera</i> spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research</p>			

Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2007, June 4].)

II - A3. Impact on Natural Community Structure

Choose one answer that best describes this plant's impact on community structure:	
<input type="checkbox"/>	No impact, establishes in an existing layer without influencing its structure (0 points)
<input type="checkbox"/>	Influences structure in one layer (e.g., changes the density of a layer) (3 points)
<input checked="" type="checkbox"/>	Significant impact on at least one layer (e.g., creation of a new layer, elimination of an existing layer) (7 points)
<input type="checkbox"/>	Major alteration of structure (e.g., covers canopy, eradicating most or all layers below) (10 points)

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input checked="" type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
<p>Comments, supportive evidence, and explanation of documentation level:</p> <p>2. Impact on Ecological Community Structure: High/Moderate significance</p> <p>Comments: In many U.S. forests, previously open understories are now near-impenetrable masses of <i>Lonicera tatarica</i>, or the hybrid cross of <i>L. tatarica</i> and <i>Lonicera morrowi</i>, <i>Lonicera x bella</i> (Woods, 1993), although the hybrid swarm is most extensively distributed in the northeastern U.S. (www.natureserve.org)</p> <p>Bell's honeysuckle, along with common buckthorn, composed a "nearly continuous, almost impenetrable" shrub layer in an oak (<i>Q x palaeolithicola</i>) -dominated forest in southern Wisconsin [87]. Competition, especially for light, is the most commonly described means by which bush honeysuckles impact native plants. For example, Barnes [7] found light levels beneath dense Bell's honeysuckle thickets in southern Wisconsin were between 0.32 and 0.8% of light in the open. (Munger, Gregory T. 2005. <i>Lonicera</i> spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2007, June 4].)</p> <p>Form a dense layer that shades the ground, interfering with the growth of many native woody and herbaceous species, including rare plants. The ground under a honeysuckle thicket is often void of other vegetation. (University of Maine Cooperative Extension, Bulletin #2507; Shrubby Honeysuckles; www.umext.maine.edu/onlinepubs/htmpubs/2507.htm)</p>			

II – A4. Impact on Natural Community Composition

Choose one answer that best describes this plant's impact on community composition:	
<input type="checkbox"/>	No impact, causes no known changes in native populations (0 points)
<input type="checkbox"/>	Influences community composition (e.g., reduces the number of individuals in one or more native populations by reducing recruitment) (3 points)
<input checked="" type="checkbox"/>	Significantly alters community composition (e.g., produces a significant reduction in the population size of one or more native species in the community) (7 points)
<input type="checkbox"/>	Causes major alteration in community composition (e.g., results in the extirpation of one or several native species, reducing biodiversity or changing the community composition towards species exotic to the natural community) (10 points)

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input checked="" type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
<p>Comments, supportive evidence, and explanation of documentation level:</p> <p>3. Impact on Ecological Community Composition: High significance</p> <p>Comments: In 3 Vermont stands and 1 in Massachusetts, Woods (1993) found both native herb richness and cover declined with increasing <i>Lonicera tatarica</i> (parent species) cover and native tree seedling density similarly declined as new seedlings were prevented once the <i>L. tatarica</i> was established. Mechanisms for this are likely due to earlier establishment of <i>L. tatarica</i> with leaf expansion beginning approximately 2 weeks earlier than for trees in the same stands and longer retention of green leaves later in the season. The parent, <i>Lonicera morrowii</i>, suppresses spring ephemerals and forest regeneration (Batcher and Stiles, 2002; Nyboer, 1992; Williams, 2001).</p> <p>Reduces the richness and cover of herb communities. (USDA Forest Service Weed of the Week; www.na.fs.fed.us/fhp/invasive_plants)</p> <p>Form a dense layer that shades the ground, interfering with the growth of many native woody and herbaceous species, including rare plants. The ground under a honeysuckle thicket is often void of other vegetation. (University of Maine Cooperative Extension, Bulletin #2507; Shrubby Honeysuckles; www.umext.maine.edu/onlinepubs/htmlpubs/2507.htm)</p> <p>A variety of impacts has been ascribed to bush honeysuckle invasion. Most impacts are associated with their competitive dominance, potentially resulting in displacement of native species. It is likely that interference from dense bush honeysuckle populations can suppress advance regeneration of native tree seedlings. Woods [198] studied invasion of bush honeysuckles (in this study Tatarian honeysuckle and Bell's honeysuckle were not distinguished, although the text referred only to Tatarian honeysuckle (see Taxonomy)) in 3 sugar maple-dominated stands in Vermont, plus a red maple-dominated forest in</p>			

northwestern Massachusetts. He found tree seedling (<1 m tall) density declined significantly ($p < 0.01$) with increasing Tatarian honeysuckle cover. Average seedling density at all sites was $>5 \text{ m}^{-2}$ where Tatarian honeysuckle was not present, but was $<1 \text{ m}^{-2}$ when Tatarian honeysuckle cover was $>90\%$. It was suggested that understory dominance by bush honeysuckles, as was observed, could ultimately alter successional patterns in forests typical to these. Even if seedlings of shade tolerant tree species can establish, interference from dense bush honeysuckle populations may still impact recruitment into mid-story or subcanopy status. He found herb species richness and herbaceous cover both declined significantly ($p < 0.05$) with increasing Tatarian honeysuckle cover.

Barnes [7] determined that Bell's honeysuckle is generally a stronger competitor than the native shrub gray dogwood where they co-occur in southern Wisconsin. Although no mechanisms for this apparent competitive advantage were directly determined, emphasis was placed on differences in leaf phenology. Barnes [7] observed that dense Bell's honeysuckle thickets had a very sparse herbaceous component compared with native shrub thickets in southern Wisconsin. He asserted that the effects of Bell's honeysuckle on herbs was similar to that of woody evergreens, in that they can suppress herb-layer development by casting shade throughout the effective seasonal range of most herbaceous species. In comparison, leaf development in most native shrubs occurs later in spring, generally allowing sufficient light for growth and reproduction of spring ephemeral herbs.

(Munger, Gregory T. 2005. *Lonicera* spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2007, June 4].)

The "hybrid swarm" of *L. morrowii*, *L. tatarica* and *L. x bella* causes a complicated situation in natural habitats. Regardless of which plant is actually present, all of these plants form dense stands that can suppress the growth of native species of plants. Thus, ecologically, these plants all appear to be very similar in their effects. (Invasive Plant Atlas of New England; <http://www.lib.uconn.edu/webapps/ipane/browsing.cfm?descriptionid=69>)

In mesic stands with relatively rich soil, total herbaceous cover, herb species richness and density of tree seedlings were substantially depressed when *L. tatarica* cover exceeded ca. 30%, a relationship not observed at a dry poor site.

[In this study, *L. tatarica* is not distinguished from *L. x bella*, a hybrid of *L. tatarica* and *L. morrowii*. Barnes (1972) concludes that the hybrid swarm is extensively distributed in the northeastern US so the populations studied here may be taxonomically complex.] (Woods, KD. 1993. Effects of invasion by *Lonicera tatarica* L. on herbs and tree seedlings in four New England forests. *American Midland Naturalist* 130:62-74)

II - A5. Conservation Significance of the Natural Systems and Native Species Threatened

Many invaders occur primarily in disturbed, low quality habitats that are dominated by other invasive plants. Invasive plants have a greater impact if they (a) directly or indirectly threaten native species or communities that are considered rare or vulnerable (e.g., Federally listed or ranked G1-G3 by The Nature Conservancy and Natural Heritage Network) or (b) threaten outstanding, high quality occurrences of common community types.

Indicate below the natural communities (Michigan Natural Features Inventory, 1986) in which the plant has become invasive, and then list any rare species that are or are likely to become threatened by this plant. (Note: * indicates a state rank of S1-S3; ** indicates global rank of G1-G3 and state rank of S1-S3)

Natural Communities Affected

Wetland		
Marsh:	<input type="checkbox"/> Submergent marsh <input type="checkbox"/> Emergent marsh <input type="checkbox"/> Great Lakes marsh* <input type="checkbox"/> Northern wet meadow <input type="checkbox"/> Southern wet meadow*	<input type="checkbox"/> Inland salt marsh ** <input type="checkbox"/> Intermittent wetland ** <input type="checkbox"/> Coastal plain marsh ** <input type="checkbox"/> Interdunal marsh **
Prairie:	<input type="checkbox"/> Lakeplain wet prairie ** <input type="checkbox"/> Lakeplain wet-mesic prairie **	<input type="checkbox"/> Wet prairie ** <input type="checkbox"/> Wet-mesic prairie **
Fen:	<input type="checkbox"/> Prairie fen ** <input type="checkbox"/> Northern fen *	<input type="checkbox"/> Patterned fen ** <input type="checkbox"/> Poor fen **
Bog:	<input type="checkbox"/> Bog	<input type="checkbox"/> Muskeg *
Forest:	<input type="checkbox"/> Poor conifer swamp <input type="checkbox"/> Rich conifer swamp * <input type="checkbox"/> Relict conifer swamp **	<input type="checkbox"/> Hardwood-conifer swamp ** <input type="checkbox"/> Southern swamp * <input type="checkbox"/> Southern floodplain forest **
Shrub:	<input type="checkbox"/> Northern shrub thicket <input type="checkbox"/> Southern shrub-carr	<input type="checkbox"/> Inundated shrub swamp *
Forest/marsh:	<input type="checkbox"/> Wooded dune and swale complex **	

Upland:		
Forest:	<input type="checkbox"/> Mesic southern forest (southern hardwood) ** <input type="checkbox"/> Dry-mesic northern forest (pine-hardwood)* <input type="checkbox"/> Dry-mesic southern forest (oak-hardwood) * <input type="checkbox"/> Dry northern forest (pine) *	<input type="checkbox"/> Dry southern forest (oak forest) * <input type="checkbox"/> Boreal forest * <input type="checkbox"/> Mesic northern forest (northern hardwood and hemlock-hardwood) *
Savanna:	<input type="checkbox"/> Lakeplain oak openings ** <input type="checkbox"/> Bur oak plains ** <input type="checkbox"/> Oak openings ** <input type="checkbox"/> Oak barrens **	<input type="checkbox"/> Pine barrens ** <input type="checkbox"/> Great lakes barrens ** <input type="checkbox"/> Northern bald (krummholz ridgetop) **
Prairie:	<input type="checkbox"/> Mesic prairie ** <input type="checkbox"/> Hillside prairie ** <input type="checkbox"/> Mesic sand prairie **	<input type="checkbox"/> Woodland prairie ** <input type="checkbox"/> Dry sand prairie **
Primary:	<input type="checkbox"/> Open dunes ** <input type="checkbox"/> Sand gravel beach ** <input type="checkbox"/> Cobble beach * <input type="checkbox"/> Bedrock beach * <input type="checkbox"/> Alvar ** <input type="checkbox"/> Bedrock glade **	<input type="checkbox"/> Dry non-acid cliff * <input type="checkbox"/> Moist non-acid cliff * <input type="checkbox"/> Dry acid cliff * <input type="checkbox"/> Moist acid cliff * <input type="checkbox"/> Sinkhole **

Native Species affected:	<p>4. Impact on Individual Native Plant or Animal Species: High/Moderate significance</p> <p>Comments: In 3 Vermont stands and 1 in Massachusetts, Woods (1993) found both native herb richness and cover declined with increasing <i>Lonicera tatarica</i> (parent species) cover and native tree seedling density similarly declined as new seedlings were prevented once the <i>L. tatarica</i> was established. Mechanisms for this are likely due to earlier establishment of <i>L. tatarica</i> with leaf expansion beginning approximately 2 weeks earlier than for trees in the same stands and longer retention of green leaves later in the season. In addition, fruits of bush honeysuckles are not as high in fats and nutrients as native fruits so migrating birds</p>
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	<p>feeding on them must feed more or suffer reduced fitness. Fruits of the parent <i>Lonicera morrowii</i> have been shown to change the plumage color of cedar waxwings when the birds feed primarily on them (Witmer, 1996). (www.natureserve.org)</p>
Global Heritage Status Rank:	
National Heritage Status Rank (U.S.):	
National Heritage Status Rank (Canada):	
Michigan Rank:	
Michigan wetland category:	
Physiognomy:	
Wetness coefficient:	
Other information:	

Conservation Significance

Based on this information, choose one answer that best describes the overall conservation significance of native species or communities affected by this plant:	
<input type="checkbox"/>	Found only in human-disturbed habitats and not known to impact any vulnerable or high quality native species or communities (0 points)
<input type="checkbox"/>	Usually inhabits common, unthreatened habitats and rarely impacts vulnerable or high quality species or communities (3 points)
<input type="checkbox"/>	Known to occasionally threaten vulnerable or high quality species or communities (7 points)
<input checked="" type="checkbox"/>	Known to often inhabit one or more vulnerable or high quality communities and/or often threatens rare native species (15 points)

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input checked="" type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
<p>Comments, supportive evidence, and explanation of documentation level:</p> <p>Bell's honeysuckle is found in habitats similar to those where Tatarian honeysuckle and Morrow's honeysuckle occur in Michigan [186]. It occurs in mesic sugar maple- and red maple-dominated forests in Vermont and Massachusetts [198]. Bell's honeysuckle and common buckthorn (<i>Rhamnus cathartica</i>) were the dominant shrub species in an oak (<i>Q. × palaeolithicola</i>) -dominated forest in southern Wisconsin [87]. Bell's honeysuckle is present, but not common, in southeastern Wisconsin shrub-carr communities, which are wet-ground plant communities dominated by tall shrubs other than alder (<i>Alnus</i> spp.), with an understory intermediate between meadow and lowland forest [193]. Barnes and Cottam [8] noted Bell's honeysuckle in all of the 30 terrestrial plant communities located within the University of Wisconsin Madison Arboretum. Barnes [7] sampled Bell's honeysuckle seedling density and frequency at 4 sites in southern Wisconsin. The site with the highest seedling frequency (39%) was characterized as a red pine (<i>Pinus resinosa</i>)- and eastern white pine (<i>P. strobus</i>)-dominated overstory and a sparse understory. (Munger, Gregory T. 2005. <i>Lonicera</i> spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2007, June 4].)</p> <p>9. Diversity of Habitats or Ecological Systems Invaded in Nation: High significance</p> <p>Comments: This hybrid cross has become an aggressive invader of lower elevation forests throughout northeastern U.S., growing most densely along forest edges and in clearings, but also invading the interior of intact forests (Woods, 1993). It is capable of living in a broad range of plant communities with varying moisture and shade levels; much more broad than either of its two parents (Munger, 2005). Woodlands are most affected, and are particularly vulnerable if the habitat is already disturbed. Plants</p>			

thrive in sunny, upland habitats, including forest edges, roadsides, pastures, and abandoned fields. They can also be found in fens, bogs, and lakeshores (Wisconsin Department of Natural Resources, 2004). (www.natureserve.org)

Impact Subrank: Section II: Natural Systems

Total Points from questions II – A1 to II – A5	54
Natural Systems Impact Subrank:	H
Determine a Subrank using this scale: 0 – 12 points = I; 13 – 28 = L; 29 – 45 = M; 46 – 65 = H	H

II - B. Production/Managed Forests, Christmas Tree Plantations

Definition: Forests managed for wood and fiber production and/or wildlife or other values such as pine plantations, aspen, northern hardwoods, and Christmas tree plantations.

Desirable or Weed Plant

Is the plant in question:		
An intended crop or desirable plant	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Considered a weed plant	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
If the answer is yes to crop/desirable plant than proceed to section II-C. If the plant is identified as a weed plant continue		

Extensiveness

How extensive is this plant?	
<input type="checkbox"/>	It is not known to occur (0 points)
<input type="checkbox"/>	Scattered individuals or present in small isolated patches (3 points)
<input checked="" type="checkbox"/>	Establishes along forest edges or in areas disturbed by forest management activities- i.e. roads, landings, clearing or skid trails (7 points)
<input type="checkbox"/>	Ubiquitous throughout, spreading or dominant in the understory (15 points)

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level: See references below			

Production Impact

Is it impacting production?	
<input type="checkbox"/>	No impact to tree regeneration (0 points)
<input type="checkbox"/>	Regeneration somewhat impacted (5 points)
<input checked="" type="checkbox"/>	Regeneration moderately impacted (7 points)
<input type="checkbox"/>	Tree regeneration is not occurring because of this plant. (15 points)

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input checked="" type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level:			

Production/Management Stages

At what production/management stages does this plant have a negative impact? Check all that apply:			
<input type="checkbox"/>	None (0 points)	<input checked="" type="checkbox"/>	Sapling stage (10 points)
<input type="checkbox"/>	Planting (5 points)	<input type="checkbox"/>	Pole stage or mature stand (15 points)
<input checked="" type="checkbox"/>	Seedling establishment (5 points)		

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal

Comments, supportive evidence, and explanation of documentation level:

Forest regeneration following disturbance can be severely impeded. In a study in New England, the L. tatarica-L. morrowii-L. x bella complex reduced. . the establishment of new seedlings. (Batcher, MS and Stiles, SA. 2000. Element stewardship abstract for L. maackii, L. morrowii, L. tatarica, L. x bella: the bush honeysuckles. The Nature Conservancy)

Delays establishment of new seedlings. (USDA Forest Service Weed of the Week; www.na.fs.fed.us/fhp/invasive_plants)

It is likely that interference from dense bush honeysuckle populations can suppress advance regeneration of native tree seedlings. Woods [198] studied invasion of bush honeysuckles (in this study Tatarian honeysuckle and Bell's honeysuckle were not distinguished, although the text referred only to Tatarian honeysuckle (see Taxonomy)) in 3 sugar maple-dominated stands in Vermont, plus a red maple-dominated forest in northwestern Massachusetts. He found tree seedling (<1 m tall) density declined significantly ($p < 0.01$) with increasing Tatarian honeysuckle cover. Average seedling density at all sites was $>5 \text{ m}^{-2}$ where Tatarian honeysuckle was not present, but was $<1 \text{ m}^{-2}$ when Tatarian honeysuckle cover was $>90\%$. (Munger, Gregory T. 2005. Lonicera spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2007, June 4].)

In all stands, tree seedling density (seedlings $< 1 \text{ m}$ tall) declined significantly with increasing Lonicera tatarica cover. [In this study, L. tatarica is not distinguished from L. x bella, a hybrid of L. tatarica and L. morrowii. Barnes (1972) concludes that the hybrid swarm is extensively distributed in the northeastern US so the populations studied here may be taxonomically complex.] (Woods, KD. 1993. Effects of invasion by Lonicera tatarica L. on herbs and tree seedlings in four New England forests. American Midland Naturalist 130:62-74)

The following information will not be scored in the assessment however it is useful in determining MIPC Plan of Action.

Silvicultural Treatments

What silvicultural treatments associated with the crop species may influence the presence of this plant. Check all that apply:	
<input type="checkbox"/>	Natural regeneration
<input checked="" type="checkbox"/>	Site prep
<input type="checkbox"/>	Planting
<input checked="" type="checkbox"/>	Selection cut
<input checked="" type="checkbox"/>	Thinning
<input checked="" type="checkbox"/>	Clear cut
<input type="checkbox"/>	Whole tree
<input type="checkbox"/>	Shortwood

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input type="checkbox"/>	Other published material	<input checked="" type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level:			

Introduction sources

Introduction sources. Check all that apply:	
<input checked="" type="checkbox"/>	Corridors (roads, utility, trails, streams, and rivers)
<input type="checkbox"/>	Seed mixes-re-vegetation practices
<input type="checkbox"/>	Seed bank
<input checked="" type="checkbox"/>	Equipment- logging, recreational, road building (skidders, harvesters, ATV's, road graders)
<input type="checkbox"/>	Borrow material (gravel, sand, topsoil)
<input checked="" type="checkbox"/>	Wildlife (mammals, birds)
<input type="checkbox"/>	People (recreational user, cars, boats)
<input checked="" type="checkbox"/>	Unauthorized dumping
<input checked="" type="checkbox"/>	Plants on adjacent sites

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input checked="" type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
<p>Comments, supportive evidence, and explanation of documentation level:</p> <p>Seeds are readily dispersed by birds and, perhaps, small mammals. (Batcher, MS and Stiles, SA. 2000. Element stewardship abstract for <i>L. maackii</i>, <i>L. morrowii</i>, <i>L. tatarica</i>, <i>L. x bella</i>: the bush honeysuckles. The Nature Conservancy)</p> <p>Several sources indicate bush honeysuckle seeds are dispersed primarily by frugivorous birds [7,80,93,126,186]. White-tailed deer may also consume and disperse viable seeds of Tatarian honeysuckle, Morrow's honeysuckle, Bell's honeysuckle, and Amur honeysuckle [180]. (Munger, Gregory T. 2005. <i>Lonicera</i> spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2007, June 4].)</p>			

Impact Subrank: Section II-B. Production/Managed Forests, Christmas Tree Plantations

Add total points		29
Rating:	≤ 5 = Insignificant (I) $>5 \leq 13$ = Low (L) $>13 \leq 34$ = Medium (M) >34 = High (H)	
Production/Managed Forests, Christmas Tree Plantations Subrank:		H

II-C. Impacts on Managed Landscapes within Suburban and Urban Ecosystems

Definition: Public and private areas within suburban and urban communities managed for green belts, linear parks, parks, and other recreational uses as well as urban forests and open space integrated throughout residential and commercial centers. Commercial centers include retail centers, corporate campuses and industrial areas. These areas are typically managed with various degrees of input by individual property owners, public agencies and/or commercial contractors and include unmanaged peripheral areas.

Desirable or weed plant

Is the plant in question:		
An intended or desirable plant:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
Considered a weed plant:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
If the answer is yes to desirable plant than proceed to section II-D. If the plant is identified as a weed plant continue		

Extensiveness

How extensive is this plant in suburban and urban ecosystems?	
<input type="checkbox"/>	Not present (0 points)
<input type="checkbox"/>	Present in scattered areas and isolated patches (3 points)
<input checked="" type="checkbox"/>	Present in areas not receiving routine or regular management practices (5 points)
<input type="checkbox"/>	Persistent throughout suburban and urban ecosystems. (15 points)

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input checked="" type="checkbox"/>	Observational
<input type="checkbox"/>	Other published material	<input checked="" type="checkbox"/>	Anecdotal
<p>Comments, supportive evidence, and explanation of documentation level:</p> <p>As of 1974 this species was widely used as an ornamental shrub because of the beauty of its flowers and persistent fruits. The authors state: “ It frequently escapes from cultivation, especially near our larger cities. Also influencing the distance and rate of dispersal of this species is the fact that the seeds. . .are disseminated by birds.” (Barnes, WJ and Cottam, G. 1974. Some autecological studies of the Lonicera x bella complex. Ecology 55(1):40-50)</p> <p>Dirr notes 15 cultivars of L. tatarica and states it’ s often considered the “ best” of the honeysuckles because of the many cultivars. He goes on to say this is essentially an outmoded plant in modern landscapes. (Dirr, M. 1998. Manual of Woody Landscape Plants. pp. 585-586)</p>			

Impact on visual appeal

Impact on visual appeal of landscape compositions:	
<input type="checkbox"/>	Does not alter visual appeal (0 points)
<input type="checkbox"/>	Visual appeal compromised during limited periods or season (3 points)
<input checked="" type="checkbox"/>	Requires periodic attention to maintain visual appeal (7 points)
<input type="checkbox"/>	Requires regular attention to maintain visual appeal (15 points)

Level of Documentation

Place a check next to the most accurate category and briefly explain

<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input checked="" type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level:			

Impact on Desirable Plant Composition

Impact on Desirable Plant Composition:	
<input type="checkbox"/>	No impact on surrounding desirable plants (0 points)
<input type="checkbox"/>	Minor competition for light, water and nutrients without a direct influence on desirable plant quality (3 points)
<input checked="" type="checkbox"/>	Competes and causes minor impacts on desirable plants' quality (7 points)
<input type="checkbox"/>	Major influences on desirable plant quality caused by competition and changes in environmental conditions. (15 points)

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level: See previously listed references			

The following information will not be scored in the assessment however it is useful in determining MIPC Plan of Action .

Introduction Sources

Introduction Sources. Check all that apply:			
<input type="checkbox"/>	Seed bank	<input checked="" type="checkbox"/>	Equipment
<input checked="" type="checkbox"/>	Off site plants	<input type="checkbox"/>	Topsoil/mulch/compost materials
<input checked="" type="checkbox"/>	On site plant	<input checked="" type="checkbox"/>	Unauthorized dumping
<input type="checkbox"/>	Seed mixes	<input checked="" type="checkbox"/>	Wildlife

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level:			

Where found

Where is it found in the landscape?			
<input type="checkbox"/>	Ornamental beds	<input checked="" type="checkbox"/>	Open space
<input checked="" type="checkbox"/>	Boulevards and common areas	<input checked="" type="checkbox"/>	Corridors
<input checked="" type="checkbox"/>	Edges of landscaped areas	<input checked="" type="checkbox"/>	Vacant land
<input checked="" type="checkbox"/>	Woodlots		

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level: See previous references.			

Impact Subrank: Section II-C. Managed Landscapes

Add total points		19
Rating:	$\leq 6 = \text{Insignificant (I)}$ $>6 \leq 9 = \text{Low (L)}$ $>9 \leq 36 = \text{Medium (M)}$ $>36 = \text{High (H)}$	
Managed Landscapes within Suburban and Urban Ecosystems Subrank:		M

II - D. Impact on Agricultural, Horticultural and Turf Production Systems

Definition: Production areas for agronomic, horticultural, and other commodity crops. These include fields, orchards, and plantations.

Desirable or Weed

Is the plant in question:		
An intended crop:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
Considered a weed plant:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
If the answer is yes to crop than proceed to section III. If the plant is identified as a weed plant continue		

Ability to invade

Ability to invade agricultural, horticultural, and turf production systems:	
<input type="checkbox"/>	Not known to be present (0 points)
<input checked="" type="checkbox"/>	Present in scattered areas and isolated patches (3 points)
<input type="checkbox"/>	Occurs on a regular basis in production systems (7 points)
<input type="checkbox"/>	Spreads throughout production systems and beyond into adjacent areas (15 points)

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level:			

Based on my travels and reading, this species has all but disappeared from the nurseries and arboreta of the United States. (Dirr 1998)

Impact on production

Is it impacting plant/crop production?	
<input checked="" type="checkbox"/>	No impact to production (0 points)
<input type="checkbox"/>	Somewhat impacted (5 points)
<input type="checkbox"/>	Moderately impacted (7 points)
<input type="checkbox"/>	Severely impacted (15 points)

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level:			

Impact throughout production cycle

Does the plant have a negative impact throughout production cycle? Check all that apply:	
<input type="checkbox"/>	Planting (5 points)
<input type="checkbox"/>	Seedling/plant establishment (5 points)
<input type="checkbox"/>	Crop maturation (7 points)
<input type="checkbox"/>	Harvest (7 points)
<input type="checkbox"/>	Processing (10 points)
<input type="checkbox"/>	Fallow fields (3 points)

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level:			

The following information will not be scored in the assessment however it is useful in determining MIPC Plan of Action .

Introduction sources

Introduction sources. Check all that apply:	
<input type="checkbox"/>	Seed bank
<input checked="" type="checkbox"/>	Off site plants
<input checked="" type="checkbox"/>	On site plant
<input type="checkbox"/>	Seed mixes
<input checked="" type="checkbox"/>	Equipment
<input type="checkbox"/>	Topsoil/mulch/compost materials
<input checked="" type="checkbox"/>	Unauthorized dumping
<input checked="" type="checkbox"/>	Domestic animals
<input checked="" type="checkbox"/>	Wildlife

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level:			

Impact Subrank: Section II-D. Agricultural, Horticultural, and Turf Production Systems

Add total points		3
Rating:	≤ 5 = Insignificant (I) $>5 \leq 10$ = Low (L) $>10 \leq 36$ = Medium (M) >36 = High (H)	
Agricultural, Horticultural and Turf Production Systems Subrank:		1

II – E. Impact on Constructed Habitat Systems

Definition: Constructed Habitat in disturbed areas. These include woodland, prairie, and wetland construction and/or restoration.

Desired or Weed

Is the plant in question:		
A desired plant:	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Considered a weed plant:	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
If the answer is yes to desired plant than proceed to section III. If the plant is identified as a weed plant continue		

Ability to invade

Ability to invade constructed habitats:	
<input type="checkbox"/>	Not known to be present (0 points)
<input checked="" type="checkbox"/>	Present in scattered areas and isolated patches (3 points)
<input type="checkbox"/>	Occurs on a regular basis in habitat systems (7 points)
<input type="checkbox"/>	Spreads throughout the habitat and beyond into adjacent areas (15 points)

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
<p>Comments, supportive evidence, and explanation of documentation level:</p> <p>No information specifically available on presence in constructed habitats, however, according to the literature, any area that has experienced disturbance and has a nearby seed source could potentially be vulnerable to invasion.</p> <p>It appears that bush honeysuckle establishment is often facilitated by some form of habitat disturbance [152].</p> <p>(Munger, Gregory T. 2005. Lonicera spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2007, June 4].)</p> <p>Records taken from specimens in the University of Wisconsin Herbarium, show that 34% of the locations are from man-disturbed areas, and 23% are from naturally disturbed areas such as lake, river and streambank locations. Although the single largest number of records, 28%, are from woods or wooded areas, many of these were characterized as second growth woods or open woods, or the plant was said to be growing within openings or at the edge of the woods. The local evidence indicates that <i>L. x bella</i> is</p>			

a plant of disturbance, but that it has a tremendous amplitude of tolerance for temperature, soil moisture, soil type, and light. (Barnes, WJ and Cottam, G. 1974. Some autecological studies of the *Lonicera x bella* complex. Ecology 55:40-50)

Often the source of the invasion comes from a planting or from a highly disturbed successional community in which the honeysuckle has flourished (referring to Tartarian, Morrow' s, Belle and Amur honeysuckles). Wetlands, prairie, and forested communities are all affected. Habitat disturbance appears to be a key to introduction of these species. (Nybour, R. 1992. Vegetation Management Guideline. Illinois Department of Conservation. Written for the Illinois Nature Preserves Commission. www.inhs.uiuc.edu/chf/outreach/VMG/bhnysckl.html)

Impact on Habitat

Impact on Habitat Composition:	
<input type="checkbox"/>	No impact on habitat plant composition (0 points)
<input type="checkbox"/>	Minor competition for light, water, and nutrients without a direct influence on desirable plant compositions (3 points)
<input checked="" type="checkbox"/>	Competes and causes minor impacts on desirable plant compositions (7 points)
<input type="checkbox"/>	Major influences on habitat composition caused by competition and changes in environmental conditions. (15 points)

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level: See previously listed references			

Impact throughout habitat

Does the plant have a negative impact throughout the habitat? Check all that apply:	
<input checked="" type="checkbox"/>	Planting (3 points)
<input checked="" type="checkbox"/>	Seedling/plant establishment (5 points)
<input checked="" type="checkbox"/>	Habitat maturation (10 points)

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level: See previously listed references			

The following information will not be scored in the assessment however it is useful in determining MIPC Plan of Action .

Introduction sources

Introduction sources. Check all that apply:	
<input checked="" type="checkbox"/>	Seed bank
<input checked="" type="checkbox"/>	Off site plants
<input checked="" type="checkbox"/>	On site plant
<input type="checkbox"/>	Seed mixes
<input checked="" type="checkbox"/>	Equipment
<input type="checkbox"/>	Topsoil/mulch/compost materials
<input type="checkbox"/>	Domestic animals
<input checked="" type="checkbox"/>	Wildlife

Impact Subrank:: Section II-E. Constructed Habitat

Add total points		28
Rating:	≤ 3 = Insignificant (I) >3 ≤ 10 = Low (L) > 10 ≤ 31 = Medium (M) >32 = High (H)	
Constructed Habitat Subrank:		M

Section III. Distribution In Michigan And The United States

Document the known distribution of this plant. Indicate the area of origin for the species (Original Range) and the earliest documented occurrence in North America. Then, for Michigan, identify the extent of its occurrence in each of four ecological regions (Albert 1995). The four ecological regions of Michigan, as pictured below, have been delineated based on broad climatic, geologic, edaphic, and vegetation patterns, and provide a more meaningful framework for assessing invasiveness than geopolitical boundaries.

Known distribution

<p>Original Range (world wide)</p>	<p>Forests of west-central Eurasia including western and central Russia (Batcher and Stiles, 2000). (www.natureserve.org)</p> <p>The hybrids were first raised in the Munden Botanic Garden from seeds received from the St. Petersburg (Russia) Botanic Garden before 1889. (Dirr)</p>
<p>Earliest possible documentation in North America</p>	<p>L. morrowii is native to Japan and was introduced to North America circa 1875 (Rehder 1940). L. tatarica is native to western and central Russia (Barnes 1974) and was introduced to the US as early as 1752 (Rehder 1974). L. tatarica and L. morrowii hybridize to form L. x bella. (Batcher, MS and Stiles, SA. 2000. Element stewardship abstract for L. maackii, L. morrowii, L. tatarica, L. x bella: the bush honeysuckles. The Nature Conservancy)</p> <p>According to a review by Barnes [7], initial reports of Bell's honeysuckle in North America date to around the late 1800s to early 1900s. (Munger, Gregory T. 2005. Lonicera spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2007, June 4].)</p> <p>The history of introduction of this plant is related to the history of introduction of L. morrowii and L. tatarica. Deliberate hybridizations of this plant were made in Russia before 1889. It is not clear whether the hybrid was deliberately introduced or if the parents were introduced and the parents then hybridized in the United States. (Invasive Plant Atlas of New England; http://www.lib.uconn.edu/webapps/ipane/browsing.cfm?descriptionid=69)</p>

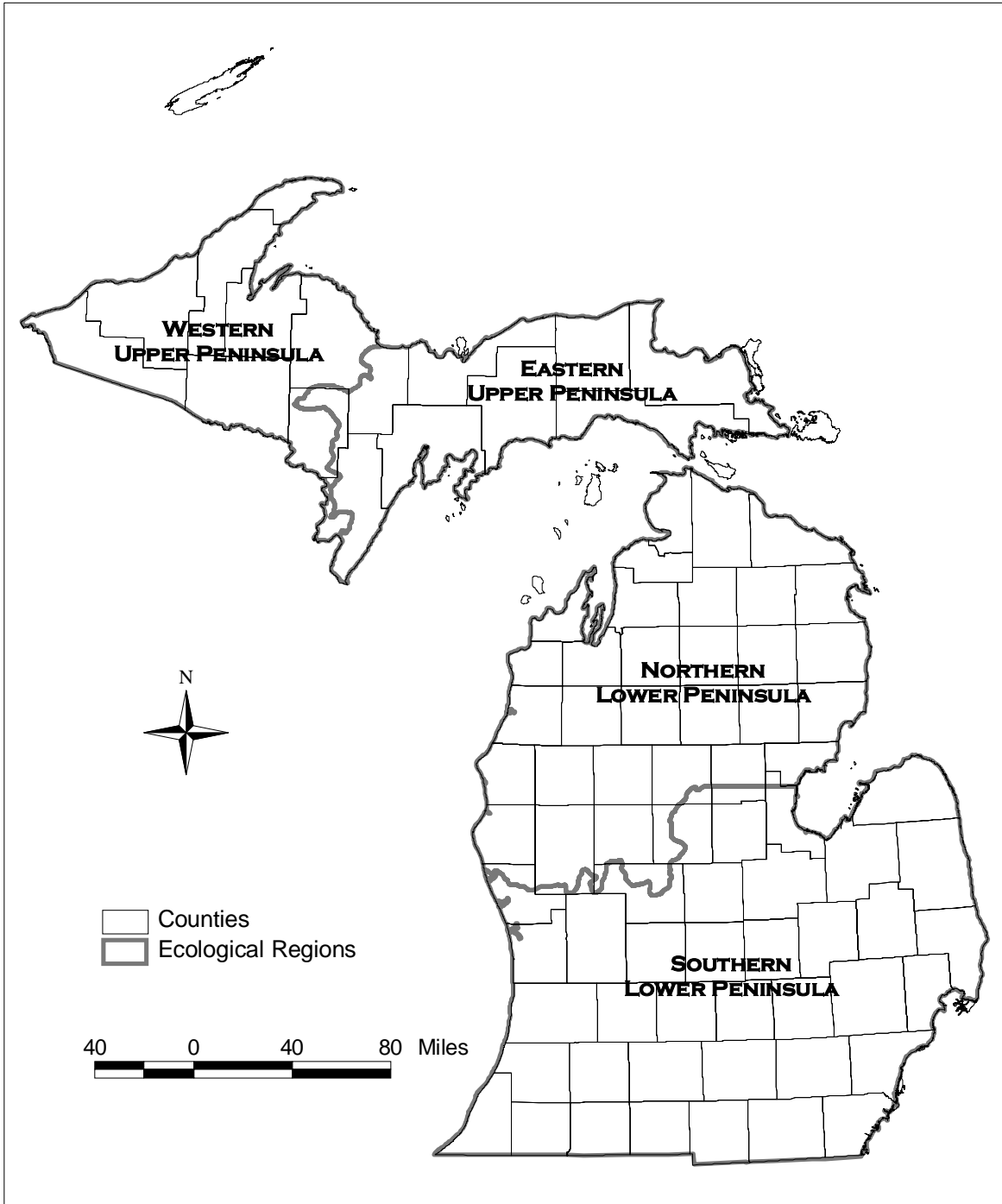
Regional Importance in Michigan

For each of the four ecological regions within Michigan, indicate the extent to which this plant has been identified as a problem.

<p>Within each region identify whether the plant is: (see glossary for definitions).</p>	<p>N (naturalized) W (widespread) L (localized) I (isolated occurrences) A (absent)</p>
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For ratings of N or W, please enter the date of earliest reported occurrence in that region. Transfer the rating for each ecological region to the Distribution Subrank at the end of this section. If the date identified as a problem is unknown place (Unk) in the appropriate place.

Ecological Regions	Rating	Date
Western Upper Peninsula (WUP)	L	Unk
Eastern Upper Peninsula (EUP)	L	Unk
Northern Lower Peninsula (NLP)	L	Unk
Southern Lower Peninsula (SLP)	W	Unk



List the Michigan counties with known infestations (if there are many counties covering large areas, those areas may be identified. For example, “all counties in the Lower Peninsula” is acceptable in lieu of listing out all those counties):

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input checked="" type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
<p>Comments, supportive evidence, and explanation of documentation level:</p> <p>Voss (1996) documents the considerable abundance of the hybrid in Michigan. (Eckel, PM. 1999. The honeysuckle hybrid <i>Lonicera morrowii</i> x <i>tatarica</i> = <i>L. x bella</i> Zabel at Buckhorn Island State Park, Erie County, New York. Originally published in <i>Clintonia</i> 14(4):5. www.mobot.org/plantscience/ResBot/niag/Repr/Honeysuckle.htm)</p> <p>The natural occurrence of <i>L. x bella</i> in Michigan and Ohio has been reported by Hauser (1966). (Barnes, WJ and Cottam, G. 1974. Some autecological studies of the <i>Lonicera x bella</i> complex. <i>Ecology</i> 55:40-50)</p> <p>USDA Plants Database (http://plants.usda.gov):</p> <p>WUP: Gogobic, Iron, Baraga, Marquette</p> <p>EUP: all except Luce, Chippewa</p> <p>NLP: Emmet, Charlevoix, Leelanau, Benzie, Presque Isle, Alpena, Alcona, Ogemaw, Crawford</p> <p>SLP: Bay, Isabella, Muskegon, Ottawa, Allegan, Berrien, Cass, Kalamazoo, Calhoun, Montcalm, Gratiot, Ionia, Eaton, Ingham, Livingston, Oakland, Macomb, Wayne, Washtenaw, Monroe, St. Clair, Lapeer, Tuscola</p>			

The following information is not scored in the assessment system however it is used to aid in determining the presence of this plant in surrounding states or provinces.

Problem in nearby states

Has this plant has been identified by land managers within Indiana, Illinois, Wisconsin, Ohio, and Ontario as a problem.

Please check the states/provinces and provide the appropriate documentation	
<input checked="" type="checkbox"/>	Indiana
<input checked="" type="checkbox"/>	Illinois
<input checked="" type="checkbox"/>	Wisconsin
<input checked="" type="checkbox"/>	Ohio
<input checked="" type="checkbox"/>	Ontario

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input checked="" type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational

<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level: http://plants.usda.gov www.natureserve.org			

Identify other areas in the U.S. in which it has been identified as a problem by land managers.

Some plants are not invasive everywhere they occur in the U.S., but only in certain regions or habitats. For instance, Tamarisks are severe riparian and wetland pests from California to Texas and north at least to Kansas, but while they escape occasionally in the eastern U.S., they have not been reported as a problem.

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input checked="" type="checkbox"/>	Reviewed scientific publication	<input checked="" type="checkbox"/>	Observational
<input type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level: Widely naturalized from Alberta, Canada, east to Maine, south to northern North Carolina, west to Missouri, and north through Kansas, eastern Nebraska, and the Dakotas (Barnes 1974). (Batcher, MS and Stiles, SA. 2000. Element stewardship abstract for <i>L. maackii</i> , <i>L. morrowii</i> , <i>L. tatarica</i> , <i>L. x bella</i> : the bush honeysuckles. The Nature Conservancy) USDA Plant Database (http://plants.usda.gov): Connecticut: invasive, banned Massachusetts: prohibited New Hampshire: prohibited invasive species Vermont: Class B noxious weed Bell's honeysuckle is ranked as a severe threat by the Tennessee Exotic Pest Plant Council [156]. It' s ranked as occasionally invasive by the Virginia Department of Conservation and Recreation [182]. Bell's honeysuckle are "high-priority" nonnative invasive plants of the Ottawa National Forest (MI) [170]. A distribution map provided by Barnes and Cottam [8] shows the U.S. distribution of Bell's honeysuckle from Maine west to northeastern Montana, most of the Dakotas, eastern Nebraska and northeastern Kansas, and south to North Carolina, Tennessee, and northern Missouri. There are also records of its occurrence in Colorado east of the continental divide [190], in South Carolina and Wyoming [83,135], and in Washington [135]. According to Barnes [7], Bell's honeysuckle is most widespread in New England and around the southern Great Lakes. (Munger, Gregory T. 2005. <i>Lonicera</i> spp. In: Fire Effects Information System, [Online]. U.S. Department			

of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2007, June 4].)

Current trends in total range within the United States.

Choose one answer that best describes the current trend:	
<input type="checkbox"/>	Declining or Historical
<input type="checkbox"/>	Stable
<input checked="" type="checkbox"/>	Increasing
<input type="checkbox"/>	Unknown

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal

Comments, supportive evidence, and explanation of documentation level:

10. Current Trend in Total Range within Nation:High/Moderate significance

Comments: This species continues to increase its range in the United States, especially the hybrid crosses with other *Lonicera* species that appear to be more invasive than either parent (see Barnes and Cottam, 1974). (www.natureserve.org)

Barnes and Cottam [8] described Bell's honeysuckle as escaped and occupying "a significant extent of territory" in the northern U.S., where it is reproducing, increasing in some areas, and spreading to new areas. (Munger, Gregory T. 2005. *Lonicera* spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2007, June 4].)

See previously listed references

Michigan Distribution Subrank: Section III Distribution In Michigan

Western Upper Peninsula (WUP)	L
Eastern Upper Peninsula (EUP)	L
Northern Lower Peninsula (NLP)	L
Southern Lower Peninsula (SLP)	W

Section IV. Control Methods

Control Methods document the availability of mechanical, chemical, biological, and fire as a resource in managing or eradicating the plant in question. Control Methods are reported as available (A), not available (NA), or under development (UD).

Control methods available

IV-A. Are Control Methods currently available for this plant?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
If yes proceed to IV –B, No = NA (non available) in all the control categories.		

IV- B. Control Methods Currently Available

Mechanical: (Check all that apply)			
<input checked="" type="checkbox"/>	Hand pulling	<input checked="" type="checkbox"/>	Pulling using tools
<input checked="" type="checkbox"/>	Mowing/Cutting	<input type="checkbox"/>	Stabbing
<input type="checkbox"/>	Girdling	<input type="checkbox"/>	Tilling
<input type="checkbox"/>	Soil Solarization	<input type="checkbox"/>	Flooding
<input type="checkbox"/>	Grazing	<input type="checkbox"/>	Other
<p>None marked = NA in the Control Method Subrank ≥ 1 marked = A in the Control Method Subrank If you did not mark any methods and are aware of methods under development please include the information in the comments section below and mark UD in the Control Method Subrank</p>			

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
<p>Comments, supportive evidence, and explanation of documentation level:</p> <p>Grubbing or pulling seedlings and mature shrubs, repeated clipping of shrubs. Grubbing or pulling by hand (using a Weed Wrench or a similar tool). (Batcher, MS and Stiles, SA. 2000. Element stewardship abstract for <i>L. maackii</i>, <i>L. morrowii</i>, <i>L. tatarica</i>, <i>L. x bella</i>: the bush honeysuckles. The Nature Conservancy)</p> <p>Seedlings may be hand-pulled when soils are moist. Bush honeysuckle stems can be cut at the base with brushcutters, chainsaws or hand tools. (Nybour, R. 1992. Vegetation Management Guideline. Illinois Department of Conservation. Written for the Illinois Nature Preserves Commission. www.inhs.uiuc.edu/chf/outreach/VMG/bhnysockl.html)</p> <p>USDA Forest Service Weed of the Week; www.na.fs.fed.us/fhp/invasive_plants</p> <p>Plant Conservation Alliance' s Alien Plant Working Group, PCA Fact Sheet: Exotic Bush Honeysuckles,</p>			

www.nps.gov/plants/alien/

Wisconsin DNR; http://dnr.wi.gov/invasives/fact/honeysuckle_bella.htm

Cutting bush honeysuckle stems may eliminate existing plants [23,24,105,108,168] and is effective in temporarily reducing seed production [108]. However, cutting established plants usually results in sprouting [43,44,45,46,75,100,108] (see asexual regeneration). According to Luken and Mattimiro [105], single cuttings that are subsequently abandoned can produce populations from sprouts that are denser and more productive than pretreatment populations. Repeated cutting as the primary control method may be effective, especially in forested habitats, but is probably not feasible for open-grown plants (see Control above) [100,105].

Bush honeysuckles may be controlled by pulling and/or digging to remove entire plants [17,23,24,75,126,152]. Seedlings are often easily pulled, especially when soils are moist [17,75,108,126,152,154]. Since bush honeysuckle roots are typically shallow (see General Botanical Characteristics), small- to medium-sized plants can often be dug or pulled [17,75]. Todd [167] reported no regrowth of bush honeysuckle shrubs in northern Illinois following control by either hand pulling small individuals when soils were wet, or by cutting near ground level and "pulling" the following year. Trisel [168] achieved complete control of established Amur honeysuckle by severing all shrubs below the root crown. However, all of the root crown and as much of the root system as possible should be removed to minimize sprouting and suckering (see asexual regeneration) [43,44,45,46,126,152,168].

(Munger, Gregory T. 2005. *Lonicera* spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2007, June 4].)

Southeast Exotic Plant Pest Council Invasive Plant Manual;
www.invasive.org/eastern/eppc/bushhoney.html

Biological Control Agents:

	Control Method Subrank
Released/available biological control agents	A
Biological control agent currently being researched Please include information in the comments section below	UD
No known biological control agents available	NA

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level: No known biological controls of Lonicera spp. (Batcher, MS and Stiles, SA. 2000. Element stewardship abstract for L. maackii, L. morrowii, L. tatarica, L. x bella: the bush honeysuckles. The Nature Conservancy)			

The following information will not be scored in the assessment however it is useful in determining MIPC Plan of Action.

Biological Control testing

Identify the crops/plants that the biological control agents have been tested on.			
Is the biological control agent known to have a negative impact on non-target species?		<input type="checkbox"/> YES	<input type="checkbox"/> NO
If yes, identify the impacts species:			

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level:			

Chemical herbicides

Chemical Herbicides: (Check all that apply)			
<input type="checkbox"/>	Pre-emergence herbicides available	<input checked="" type="checkbox"/>	Contact herbicides
<input checked="" type="checkbox"/>	Post emergence herbicides available		
None marked = NA in the Control Method Subrank ≥ 1 marked = A in the Control Method Subrank			

If you did not mark any methods and are aware of methods under development please include the information in the comments section below and mark UD in the Control Method Subrank

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal

Comments, supportive evidence, and explanation of documentation level:

A survey of TNC land managers undertaken in 1998 found that most used glyphosate, and used it as a cut stump treatment, to control *L. maackii* and/or *L. tatarica* (Randall and Meyers-Rice, unpublished). (Batcher, MS and Stiles, SA. 2000. Element stewardship abstract for *L. maackii*, *L. morrowii*, *L. tatarica*, *L. x bella*: the bush honeysuckles. The Nature Conservancy)

After cutting, a 20% solution of glyphosate should be applied to the cut stump. . . Application in late summer, early fall, or the dormant season has proven effective. (Nybour, R. 1992. Vegetation Management Guideline. Illinois Department of Conservation. Written for the Illinois Nature Preserves Commission. www.inhs.uiuc.edu/chf/outreach/VMG/bhnysckl.html)

USDA Forest Service Weed of the Week; www.na.fs.fed.us/fhp/invasive_plants

Plant Conservation Alliance' s Alien Plant Working Group, PCA Fact Sheet: Exotic Bush Honeysuckles, www.nps.gov/plants/alien/

Wisconsin DNR; http://dnr.wi.gov/invasives/fact/honeysuckle_bella.htm

Herbicides may be effective for controlling invasive bush honeysuckles. However, control with herbicides is temporary, as it does not change conditions that allow infestations to occur [201]. Glyphosate is the most commonly mentioned chemical for use against bush honeysuckles, applied either as a foliar spray [75,154,168] or to cut stumps [43,44,45,46,67,88,154,168]. Triclopyr has also shown effectiveness [75]. Most references discuss chemical control of Amur honeysuckle, but it is likely that these methods are also effective against other bush honeysuckle species. See the Weed Control Methods Handbook for considerations on the use of herbicides in natural areas and detailed information on specific chemicals.

Application of herbicide to cut stumps can provide effective control while minimizing risk of damage to associated native species [43,44,45,46,88]. Herbicide should be applied immediately after cutting, for best results [75,126]. Mechanical injection into intact stems is also effective [67]. Hoffman and Kearns [75] recommend 2 cuts/applications per year, 1 in early spring followed by another in early autumn. Others have found single early spring treatments effective [67,168].

Spraying herbicide on foliage may also be effective. While some sources indicate spraying just after flowering is most effective [75,154], early spring application has also been effective [168]. Spraying herbicide in early spring, when bush honeysuckles are actively growing but most native plants are still dormant, can minimize risk to nearby natives [75,168].

(Munger, Gregory T. 2005. *Lonicera* spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2007, June 4].)

Southeast Exotic Plant Pest Council Invasive Plant Manual;

www.invasive.org/eastern/eppc/bushhoney.html

Fire

Fire can control the spread of invasive species into or within natural areas.

Response to fire.			
<input checked="" type="checkbox"/>	Prescribed burns*	<input type="checkbox"/>	Spot burning*
None marked = NA in the Control Method Subrank ≥ 1 marked = A in the Control Method Subrank			

If you did not mark any methods and are aware of methods under development please include the information in the comments section below and mark UD in the Control Method Subrank

*Refer to IV-C to determine whether a plant's response to fire requires consideration in planning for or using this method.

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level: <p>Repeated annual prescribed burns during the growing season will top-kill shrubs and inhibit new shoot production. Because exotic bush honeysuckles readily resprout, it may be necessary to re-burn every year or every other year for several years to achieve good control (Nyboer 1992). (Batcher, MS and Stiles, SA. 2000. Element stewardship abstract for <i>L. maackii</i>, <i>L. morrowii</i>, <i>L. tatarica</i>, <i>L. x bella</i>: the bush honeysuckles. The Nature Conservancy)</p> <p>Spring prescribed burning can be used in fire-adapted communities. (Nybour, R. 1992. Vegetation Management Guideline. Illinois Department of Conservation. Written for the Illinois Nature Preserves Commission. www.inhs.uiuc.edu/chf/outreach/VMG/bhnysckl.html)</p> <p>Plant Conservation Alliance' s Alien Plant Working Group, PCA Fact Sheet: Exotic Bush Honeysuckles, www.nps.gov/plants/alien/</p> <p>FIRE MANAGEMENT CONSIDERATIONS:</p> <p>It appears that in many fire-adapted communities prescribed fire may be useful for controlling bush honeysuckles. According to several sources [75,126,152], spring prescribed burning may kill bush honeysuckle seedlings and top-kill larger plants, although results have been mixed. Maine Natural Areas Program [108] recommends burning during the growing season for most effective control. Regardless of season, it appears that a single prescribed fire is usually not sufficient to eradicate invasive bush honeysuckle populations. Because postfire sprouting is likely, subsequent prescribed burns conducted</p>			

annually or biennially for several years may be necessary [75,126,152]. Solecki [154] recommends annual or biennial spring burning for 5 or more years to control bush honeysuckles.

Annual spring prescribed burns were conducted for 5 years at Pipestone National Monument, a mosaic of dry, mesic, and wet grassland, shrubland, and woodland in southwestern Minnesota. Fire "intensity" was generally considered "low to moderate", except during the 1st year when high fuel levels were present. Objectives of this project were to assess the efficacy of using prescribed fire to control nonnative woody and herbaceous plants and to enhance native plant diversity, abundance, and cover. Tatarian honeysuckle was among several woody species, both native and nonnative, that had increased in a draw, suppressing herbaceous prairie plants. Five years of annual prescribed burning reduced Tatarian honeysuckle cover in sampled quadrats. Preburn cover in the first 2 years was 1.2%. Postburn cover in the first 2 years was 1.9% and 0.8%, respectively. Preburn cover in year 3 was 0.1%, and postburn cover in year 5 was 0.0%. Descriptions of fire effects on Tatarian honeysuckle were limited to noting "adverse" effects. It was not clear if 5 years of spring burning had eliminated Tatarian honeysuckle from the site, although the data indicate this possibility [14].

Kline and McClintock [87] conducted 2 consecutive annual mid-April prescribed burns in an oak (*Q. x palaeolithicola*) -dominated forest in southern Wisconsin (burn prescriptions are available in [87]). One objective was to determine effectiveness of prescribed burning for controlling invasive Bell's honeysuckle and common buckthorn, which composed a "nearly continuous, almost impenetrable" shrub layer. Mean cover of Bell's honeysuckle and common buckthorn, measured in early July, was 85% in prefire year 1, 56% and 38% following each respective burn, and 41% in the 1st postfire year. "Most of the individuals resprouted from the base, but the resprouts were not very vigorous. Some completely dead honeysuckles were observed" in the 1st postfire year.

Prescribed fire may be less effective for controlling particularly vigorous populations, such as those growing under full sunlight. According to Williams [194], prescribed burning has shown "some promise" for controlling bush honeysuckles growing in open habitats. But Luken [102] asserted that repeated burning to control bush honeysuckles is ineffective on open sites, due to vigorous sprouting (see Control).

As of this writing (2004) there is no information available about using prescribed fire in combination with other control methods. However, it seems likely that combinations of burning, herbicides, and physical/mechanical control methods may be useful, especially when consideration is given to the current and future desired condition of native communities on the site.

(Munger, Gregory T. 2005. *Lonicera* spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2007, June 5].)

The following information will not be scored in the assessment however it is useful in determining MIPC Plan of Action .

Response to fire

Many invasive species have the potential to invade burned areas. Since plants respond differently to varying levels of fire intensity, it is important from a managerial standpoint to determine which plants will survive and/or invade burned areas as well as determining which invasive plants are controlled by fire.

Response to fire: (Check all that apply)			
<input type="checkbox"/>	well adapted to fire	<input checked="" type="checkbox"/>	numbers decline after fire
<input checked="" type="checkbox"/>	top killed	<input type="checkbox"/>	numbers increase after fire
<input checked="" type="checkbox"/>	sprouts readily from rhizomes	<input type="checkbox"/>	seeds survive in seed bed
<input type="checkbox"/>	killed by high intensity fires	<input checked="" type="checkbox"/>	seeds are dispersed easily in a burned area
<input checked="" type="checkbox"/>	killed by low intensity fires	<input type="checkbox"/>	seed dormancy broken by fire
<input type="checkbox"/>	the presence of this plant can contribute to increased fire potential and/or intensity		

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
<p>Comments, supportive evidence, and explanation of documentation level:</p> <p>Repeated annual prescribed burns during the growing season will top-kill shrubs and inhibit new shoot production (Nyboer 1992). (Batcher, MS and Stiles, SA. 2000. Element stewardship abstract for <i>L. maackii</i>, <i>L. morrowii</i>, <i>L. tatarica</i>, <i>L. x bella</i>: the bush honeysuckles. The Nature Conservancy)</p> <p>In fire-adapted communities, spring prescribed burning will kill seedlings and kill the tops of mature plants. (Nyboer, R. 1992. Vegetation Management Guideline. Illinois Department of Conservation. Written for the Illinois Nature Preserves Commission. www.inhs.uiuc.edu/chf/outreach/VMG/bhnysckl.html)</p> <p>Mid-April burns for two years reduced European buckthorn and honeysuckle (<i>Lonicera x bella</i>) in a southern Wisconsin oak forest (Kline and McClintock 1994). The April fires were of low intensity with flame lengths of 6 to 12 in. (15 to 30 cm) burning 50 to 70% of the area. The cover of buckthorn and honeysuckle was 85% in the year before the first burn, 56% in the year after the first burn, and 38% after the second burn. The woody exotic cover increased slightly to 41% in the third year, but the resprouts were not very vigorous.</p> <p>Vegetation management guidelines suggest that spring prescribed burning can be used in fire-adapted communities to kill seedlings of bush honeysuckles or top-kill mature plants, but annual or biennial burns for five or more years are necessary for adequate control (Nyboer 1990). Data were not presented to support this recommendation nor burn prescriptions. (Rice, PM. 2005. Fire as a tool for controlling nonnative invasive plants. www.weedcenter.org/mangement/tools.htm#burning. Bozeman, MT: Center</p>			

for Invasive Plant Management. p. 33)

Although no information could be found regarding the evolutionary relationship between fire and bush honeysuckles in their native ranges, it appears that bush honeysuckles are adapted to survive fire by shielding perennating buds below the soil surface on roots and/or the root crown. Postfire sprouting has been documented [7,75,87,102,126,152] (see Fire Effects), although it is unclear if all bush honeysuckle taxa discussed possess similar abilities.

IMMEDIATE FIRE EFFECT ON PLANT:

Fire may top-kill bush honeysuckle plants, and is likely to kill seedlings and unhealthy plants [75,126,152]. However, perennating tissues on roots and root crowns are often protected from fire damage by soil. By excavating numerous Bell's honeysuckle shrubs in Wisconsin, it was determined that most roots occurred at a depth of 0.98 to 5.9 inches (2.5-15 cm) and in many cases extended well beyond crown width [7].

Fire may also kill seeds [23,24], although this is not confirmed.

DISCUSSION AND QUALIFICATION OF FIRE EFFECT:

Barnes [7] observed the effects of fire on 2 populations of Bell's honeysuckle at the University of Wisconsin Madison Arboretum. At 1 site, all leaves and buds on 9 of 12 shrubs were "apparently" killed by a fire in early May. Some "dormant buds" did survive on 3 individuals and were actively growing by late May, although location of these buds was not discussed. No further information was provided on fire effects or burn characteristics. At another site, a late-summer surface fire burned through a Bell's honeysuckle thicket, leaving scorched bark on basal stems and killing but not consuming leaves. Basal and aerial sprouts began to appear within 3 weeks postfire, and some plants produced new leaves that summer. Although it appears that some plants were top-killed, all plants survived. Only 2 of 30 sampled plants produced fruit 1 year postfire.

Kline and McClintock [87] conducted 2 consecutive annual mid-April prescribed burns in an oak (*Q. x palaeolithicola*) -dominated forest in southern Wisconsin, where Bell's honeysuckle was common in the shrub layer. "Most of the individuals resprouted from the base, but the resprouts were not very vigorous. Some completely dead honeysuckles were observed" in the 1st postfire year.

PLANT RESPONSE TO FIRE:

Although information about asexual regeneration is relatively sparse, it is apparent that sprouting is a common response to mechanical stem damage in bush honeysuckles (see physical/mechanical control). Similarly, bush honeysuckles can also produce sprouts in response to damage from fire [7,75,87,102,126,152].

Bush honeysuckles may establish from bird-dispersed seed after fire. Since snags, surviving trees, or tall shrubs are often present in postfire environments where bush honeysuckles are likely to be found (see

habitat types and plant communities) and provide perches for frugivorous birds, bush honeysuckle postfire seedling establishment may occur in this environment.

DISCUSSION AND QUALIFICATION OF PLANT RESPONSE:

Kline and McClintock [87] observed Bell's honeysuckle sprouting from the base following prescribed fire, but "resprouts were not very vigorous". Barnes [7] observed fire effects on 2 populations of Bell's honeysuckle at the University of Wisconsin Madison Arboretum. All 12 shrubs observed at 1 site resprouted from "the rootstock". At the other site, a late-summer surface fire burned through a Bell's honeysuckle thicket, leaving scorched bark on basal stems and killing but not consuming leaves. All plants subsequently sampled had survived and had produced "basal sprouts" by early the following summer.

(Munger, Gregory T. 2005. *Lonicera* spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2007, June 5].)

Control Method Subrank: Section IV: Control Method Subrank

Method	Score	Method	Score
Mechanical	A	Chemical	A
Biological	NA	Fire	A

Section V. Management Effort

Management effort identifies management potential (investment in human and financial resources) and management activity (programs being presently conducted). For most statements, no particular control methods are specified but responses should relate to the methods that are most likely to be used (refer to section IV). Management potential considers feasibility, costs, and unavoidable non-target damage. Management activity identifies current programs being employed to suppress or eradicate this plant in public and private arenas.

V-A Management Potential

Documentation must be provided. Add all points from statements which are true for this plant and record the point at the bottom of this section.

Statement	Options	Points
Despite investigation, no legally permissible and effective herbicide treatments are available and cutting or mowing alone are not sufficient to eliminate this plant.	<input type="checkbox"/> YES 15 points	
This plant is difficult to control without significant damage to native species because: it is widely dispersed throughout the sites (i.e., does not occur within discrete clumps nor monocultures); it is attached to native species (e.g., vine, epiphytes or parasite); or there is a native plant which is easily mistaken for this invader.	<input type="checkbox"/> YES 10 points	
Total contractual costs of known control method per acre in first year, including access, personnel, equipment, and materials (any needed re-vegetation is not included) exceeds \$2,000/acre (2002 estimated control costs are for acres with a 50% infestation).	<input checked="" type="checkbox"/> YES 5 points	5
Further site restoration is necessary following plant control to reverse ecosystem impacts and to restore the original habitat-type or to prevent immediate re-colonization of the invader.	<input checked="" type="checkbox"/> YES 5 points	5
Following the first year of control of this species, it would be expected that individual sites would require re-survey or re-treatment, due to recruitment from persistent seeds, spores, or vegetative structures, or by dispersal from outside the site: (choose one)	<input type="checkbox"/> multiple times per year (15 points) <input checked="" type="checkbox"/> once a year for the next 5 years; (10 points) <input type="checkbox"/> one to 4 times over the next 5 years; (6 points) <input type="checkbox"/> regrowth not known. (2 points)	10
Total Points		20

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal

Comments, supportive evidence, and explanation of documentation level:

17. General Management Difficulty:High/Moderate significance

Comments: Since honeysuckle roots are fairly shallow, small- to medium-sized plants can often be dug or pulled particularly in spring when the soil is moist. In sensitive areas, the type of physical removal may disturb the soil and lead to more invasion, in which case it should be avoided or soil should be tamped down to discourage further honeysuckle seedling establishment or physical removal should be coupled with herbicide or burning. Cutting of stems followed by treatment of 20% active glyphosate solution with a hand sprayer, sponge applicator, or contact solution bottles is effective (Wisconsin Department of Natural Resources, 2004). Mid-April burns for two years was found to reduce stands of this plant in a southern Wisconsin oak forest (Kline and McClintock, 1994 in Rice, 2005).

18. Minimum Time Commitment:High/Moderate significance

Comments: Repeated prescribed burning annually or biennially for several years may be necessary (Rice, 2005). Stem cutting with glyphosate herbicide application requires two cuts per year for three to five years (Batcher and Stiles, 2000; Wisconsin Department of Natural Resources, 2004). Most control measures (many outlined in Munger, 2005) require several years for any measure of success.

19. Impacts of Management on Native Species:Low significance

Comments: Where burning is not possible (sensitive native species), 1.5% active glyphosate solution can be sprayed to cover foliage and spraying prior to emergence of native shrubs and ground flora is the safest time to spray without impacting native species. In wetlands, glyphosate formulated for water must be used (Wisconsin Department of Natural Resources, 2004). It is best to spray new foliage in the spring (Metsulfuron-methyl plus a surfactant is broadleaf specific) before the leaves of native shrubs and ground flora emerge (Czarapata, 2005).

(www.natureserve.org)

Restoration potential is likely to be lowest where Lonicera species occur in high densities and there is a high likelihood of continued dispersal of seeds into the restoration area. The potential for large-scale restoration of unmanaged natural areas or wildlands infested with Lonicera species is probably low. Restoration potential for managed natural areas or wildlands infested with Lonicera species is probably moderate. If attacked during the early stages of colonization, the potential for successful management is high.

Effective mechanical management requires a commitment to cut or pull plants at least once a year for a

period of three to five years (Virginia Natural Heritage Program, no date). Because open soil can support rapid re-invasion, managers must monitor their efforts at least once per year and repeat control measures as needed (Nyboer 1992).

(Batcher, MS and Stiles, SA. 2000. Element stewardship abstract for *L. maackii*, *L. morrowii*, *L. tatarica*, *L. x bella*: the bush honeysuckles. The Nature Conservancy)

It may be necessary to burn annually or biennially for five years or more for effective control. Follow-up treatments may also be necessary with herbicide application due to resprouting. (Nybour, R. 1992. Illinois Department of Conservation. Written for the Illinois Nature Preserves Commission. www.inhs.uiuc.edu/chf/outreach/VMG/bhnysckl.html)

Control methods may need to be repeated for three to five years to inhibit resprouting and to exhaust the seedbank. (University of Maine Cooperative Extension, Bulletin #2507; Shrubby Honeysuckles; www.umext.maine.edu/onlinepubs/htmlpubs/2507.htm)

Because bush honeysuckles are capable of sprouting and suckering (see asexual regeneration), control efforts may require sustained effort for several years [75,108]. Control methods that create soil disturbance may provide opportunities for seedling establishment of bush honeysuckles or other invasive species [154]. Luken and McKnight [101] suggest that where dense Amur honeysuckle thickets substantially reduce herb-layer coverage, removal of this shrub layer may result in erosion and/or colonization by other invasive species. Where disturbance is unavoidable, careful monitoring and rapid eradication of new seedlings is easier, less costly and more likely to be successful compared with managing a full-blown invasion. If desired vegetation is scarce or absent, bush honeysuckle control may be of little value. Planting native species following bush honeysuckle removal can provide a desirable composition of groundcover, shrubs, and understory trees, and may also mitigate reinvasion by bush honeysuckles and other nonnative invasive plant species [23,24,67,152].

(Munger, Gregory T. 2005. *Lonicera* spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2007, June 4].)

Management Potential Subrank: Section V-A Management Potential

Add the total points:	Value
< 15 = High potential for control >=15 = Low potential for control	20
Transfer information to the Management Effort Subrank	

V-B MANAGEMENT ACTIVITY

Given the current state of knowledge regarding	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
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control methods, are activities being employed to suppress or eradicate this plant in Michigan.			
If yes please provide documentation on management efforts being used: method(s); agency(ies); location(s).			
Public Lands		Private Lands	
<input checked="" type="checkbox"/>	Federal (F):	<input checked="" type="checkbox"/>	Non-profit organizations (O):
<input checked="" type="checkbox"/>	State (S):	<input checked="" type="checkbox"/>	Commercial (C):
<input checked="" type="checkbox"/>	Municipal (M):	<input checked="" type="checkbox"/>	Individual (I)

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input checked="" type="checkbox"/>	Observational
<input type="checkbox"/>	Other published material	<input checked="" type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level: Each sector is administering multiple methods of control			

Management Activity Subrank: Section V-B Management Activity

Indicate whether management activities are being employed by a letter indicating the sector involved: federal (F), state (S), municipal (M), non-profit organization (O), commercial (C), individual (I).	Value
Transfer information to the Management Effort Subrank	F,S,M,O,C,I

Section V. Management Effort Subrank

	Value
Management Potential	L
Management Activity	F,S,M,O,C,I

Section VI. Value within Michigan

Value within Michigan indicates economic, aesthetic, erosion control, and wildlife habitat value. Value is designated either as high (H), low (L), or none (N) in each of the respective categories.

Does this plant have any value?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
If response is NO then VI = N in the value subrank table If response is YES then go to Section VI-B		

VI-A. Factors that Indicate a Economic, Aesthetic, Erosion Control or Wildlife Habitat

Add the points from statements that are true for this plant. Please provide documentation on the size, scope, and extent of the use of the designated plant. Please provide state and federal statistics where applicable. Record the score in the table following this section.

Agriculture: Crops and Forage		
This plant constituents more than 10% of the crop on commercial farms producing and/or using this plant within the State.	<input type="checkbox"/> YES 5 points	<input checked="" type="checkbox"/> NO 0 points
This plant has provided a crop, forage, or seed source (e.g., forage, nectar) that has been or resulted in a source of commercial income within the state.	<input type="checkbox"/> YES 5 points	<input checked="" type="checkbox"/> NO 0 points
This plant has provided a crop, forage, or seed source (e.g., forage, nectar) that is used by the general public within the state	<input type="checkbox"/> YES 3 points	<input checked="" type="checkbox"/> NO 0 points

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input type="checkbox"/>	Other published material	<input checked="" type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level:			

Horticulture (Fruit, Vegetable, Herbs, and Ornamentals)		
This plant constitutes more than 10% of the crop produced or sold by commercial growers within the State	<input type="checkbox"/> YES 5 points	<input checked="" type="checkbox"/> NO 0 points
This plant has provided a crop, forage, and/or seed source that has been or resulted in a source of commercial income within the state	<input type="checkbox"/> YES 5 points	<input checked="" type="checkbox"/> NO 0 points
This plant has provided a crop, forage, or seed source (e.g., forage, nectar) that is used by the general public within the state	<input type="checkbox"/> YES 3 points	<input checked="" type="checkbox"/> NO 0 points

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input checked="" type="checkbox"/>	Observational
<input type="checkbox"/>	Other published material	<input checked="" type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level:			
Michigan Nursery and Landscape Association Buyers Guide			

Turf (Sod, Golf Course, Commercial Turf (sport fields, schools, etc))		
This plant constitutes more than 10% of the crop produced or sold by commercial growers within the state	<input type="checkbox"/> YES 5 points	<input checked="" type="checkbox"/> NO 0 points
This plant has provided turf, forage, and/or seed source that has been, or resulted in a source of commercial income within the state	<input type="checkbox"/> YES 5 points	<input checked="" type="checkbox"/> NO 0 points
This plant contribute significantly to recreation and leisure activities	<input type="checkbox"/> YES 3 points	<input checked="" type="checkbox"/> NO 0 points
This plant is used in land development (public and private property)	<input type="checkbox"/> YES 3 points	<input checked="" type="checkbox"/> NO 0 points

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input checked="" type="checkbox"/>	Observational
<input type="checkbox"/>	Other published material	<input checked="" type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level:			

Forestry (Wood, Pulp, Christmas Trees)		
This plant constitutes more than 10% of the crop produced, managed, or sold by commercial forest/Christmas tree operations within the state	<input type="checkbox"/> YES 5 points	<input checked="" type="checkbox"/> NO 0 points
This plant has provided timber, pulp, plantations, seedlings/transplants, and/or seed orchards that has been or resulted in a source of commercial income for public and private forestry	<input type="checkbox"/> YES 5 points	<input checked="" type="checkbox"/> NO 0 points
This plant has value added wildlife and environmental benefits during production cycles within forest operations	<input type="checkbox"/> YES 5 points	<input checked="" type="checkbox"/> NO 0 points
This plant has provided timber, plantations, seed orchard, or recreational uses by non-commercial property owners within the state	<input type="checkbox"/> YES 3 points	<input checked="" type="checkbox"/> NO 0 points

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input checked="" type="checkbox"/>	Observational
<input type="checkbox"/>	Other published material	<input checked="" type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level:			

Landscape (Public and Private)		
This plant is currently sold in national or regional retail stores, Michigan garden centers, horticultural distribution centers or by landscape contractors	<input type="checkbox"/> YES 5 points	<input checked="" type="checkbox"/> NO 0 points
This plant is used in residential and commercial landscapes	<input checked="" type="checkbox"/> YES 5 points	<input type="checkbox"/> NO 0 points
This plant is use in public landscapes	<input checked="" type="checkbox"/> YES 5 points	<input type="checkbox"/> NO 0 points

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input checked="" type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level: Michigan Nursery and Landscape Association Buyers Guide			

Erosion: Soil and Water Erosion		
This plant has been and/or is currently used in erosion control practices such as soil erosion, storm water management, phyto-remediation, bank stabilization, etc.	<input checked="" type="checkbox"/> YES 5 points	<input type="checkbox"/> NO 0 points
This plant is specified and used by federal and state agencies in erosion control practices	<input type="checkbox"/> YES 5 points	<input checked="" type="checkbox"/> NO 0 points
This plant is specified and used by private contractors in erosion control and/or habitat restoration	<input type="checkbox"/> YES 5 points	<input checked="" type="checkbox"/> NO 0 points
This plant provides value added benefits in wildlife conservation	<input checked="" type="checkbox"/> YES 3 points	<input type="checkbox"/> NO 0 points

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
<p>Comments, supportive evidence, and explanation of documentation level:</p> <p>Some infestations have spread. . .from erosion control plantings. (USDA Forest Service Weed of the Week; www.na.fs.fed.us/fhp/invasive_plants)</p> <p>Introduced for soil erosion control. (Plant Conservation Alliance’s Alien Plant Working Group, PCA Fact Sheet: Exotic Bush Honeysuckles, www.nps.gov/plants/alien/)</p> <p>As recently as the 1980’s they were promoted for their wildlife values, ornamental use, and soil stabilization. (University of Maine Cooperative Extension, Bulletin #2507; Shrubby Honeysuckles; www.umext.maine.edu/onlinepubs/htmlpubs/2507.htm)</p> <p>It has also been used to a lesser extent in conservation planting, especially in shelterbelts in the prairie-plains region. (Barnes, WJ and Cottam, G. 1974. Some autecological studies of the <i>Lonicera x bella</i> complex. Ecology 55:40-50)</p> <p>See previously listed references</p>			

Wildlife: Food and Shelter		
This plant is currently used in wildlife management	<input type="checkbox"/> YES 5 points	<input checked="" type="checkbox"/> NO 0 points
This plant is specified or used by wildlife organizations in habitat restoration or feed plot establishment	<input checked="" type="checkbox"/> YES 5 points	<input type="checkbox"/> NO 0 points
This plant is specified and used by federal and state agencies in providing shelter and/or feed sources on public lands	<input checked="" type="checkbox"/> YES 5 points	<input type="checkbox"/> NO 0 points
This plant provides value added benefits in soil and water conservation	<input checked="" type="checkbox"/> YES 3 points	<input type="checkbox"/> NO 0 points

Level of Documentation

Place a check next to the most accurate category and briefly explain			
<input type="checkbox"/>	Reviewed scientific publication	<input type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
<p>Comments, supportive evidence, and explanation of documentation level:</p> <p>The exotic bush honeysuckles may provide an important source of winter food for birds in areas where it is abundant and few other shrubs survive (Whelan and Dilger 1992). The bush honeysuckles have been promoted for decades by the US Dept. of Agriculture and by commercial nurseries for their wildlife, shelterbelt, and ornamental value. Many state and private nurseries still sell them, although less widely than previously (Luken and Thieret 1996). (Batcher, MS and Stiles, SA. 2000. Element stewardship abstract for <i>L. maackii</i>, <i>L. morrowii</i>, <i>L. tatarica</i>, <i>L. x bella</i>: the bush honeysuckles. The Nature Conservancy)</p> <p>Some infestations have spread from wildlife habitat improvement plantings. (USDA Forest Service Weed of the Week; www.na.fs.fed.us/fhp/invasive_plants)</p> <p>Introduced for wildlife cover. (Plant Conservation Alliance's Alien Plant Working Group, PCA Fact Sheet: Exotic Bush Honeysuckles, www.nps.gov/plants/alien/)</p> <p>As recently as the 1980's they were promoted for their wildlife values, ornamental use, and soil stabilization. (University of Maine Cooperative Extension, Bulletin #2507; Shrubby Honeysuckles; www.umext.maine.edu/onlinepubs/htmpubs/2507.htm)</p> <p>Although it appears bush honeysuckles are typically planted for other purposes, they may provide some value for wildlife and are occasionally planted for this use. Bush honeysuckles probably provide some cover for wildlife.</p>			

(Munger, Gregory T. 2005. *Lonicera* spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2007, June 5].)

Value Within Michigan Subrank: Section VI: Value within Michigan

Please total the points for each area and place them in the appropriate column.

Subrank	Agriculture	Horticulture	Turf	Forestry	Landscape	Erosion Control	Wildlife Habitat
	Crop and Forage	Fruit, Vegetable, Ornamentals	Sod, Golf Course, Commercial Turf	Wood, Pulp, Christmas Trees	Public and Private	Soil and Water	Food and Shelter
Points	0	0	0	0	10	8	13
Rating	0=N <5= L >8 =H	0=N <5= L >8 =H	0=N <5= L >10 =H	0=N <5= L >8 =H	0=N <5= L >10 =H	0=N <5= L >8 =H	0=N <5= L >8 =H

Section VII. Invasiveness Rank, MIPC Plan of Action, and Plant Summary Report

Section VII is for use by MIPC. The Invasive Plant Assessment Committee will use the information provided in Sections I-VI to establish an Invasiveness Rank (based on Potential Invasiveness and Impact for each systems within the four ecological regions), a MIPC Plan of Action, and a Plant Summary Report.

Potential Invasiveness

Potential Invasiveness is a based on biological characteristics that may predispose a plant to invasive behavior. Reproductive Ability (Seed and Vegetative) + Dispersal = Potential Invasiveness.

Determine a Reproductive Ability value for this plant using the table below and the scores from the Seed and Vegetative reproduction sections on Biological Character

Reproductive Ability

Table of Reproductive Ability Values

		Vegetative Reproduction			
		H	M	L	I
Seed Reproduction	H	H	H	H	H
	M	H	M	M	L
	L	H	M	L	L
	I	H	I	I	I

	Value
Enter the Reproductive Ability Value for this plant:	H

Use the Reproductive Ability Value and the Dispersal rating from Section 1. to determine the Potential Invasiveness Value for this plant from the table below.

Potential Invasiveness

Table of Potential Invasiveness Values

		Dispersal			
		H	M	L	I
Reproductive Ability	H	H	H	M	M
	M	H	M	M	L
	L	M	M	L	L
	I	I	I	I	I

	Value
Enter the Potential Invasiveness Value for this plant:	H

Invasiveness Rank is a function of Potential Invasiveness and Impact. Impact is the expression of potential invasiveness under a given set of environmental conditions within a system (Natural System, Forest Production, Constructed Habitats, Ag/Hort/Turf Production, and Urban and Suburban Landscapes). Impact may vary among or within ecological regions. A plant's impact may occur over a broad set of environmental conditions (temperature, light, water) or be limited by one or more factors specific to a system or ecological region.

Table of Invasiveness Rank

		Impact			
		H	M	L	I
Potential Invasiveness	H	H	H	M	M
	M	H	M	M	L
	L	M	M	L	L
	I	I	I	I	I

Invasiveness Rank

Determine the Invasiveness rank for each system:	Value
Natural System	H
Forest Production	H
Ag/Hort/Turf Production	M
Constructed Habitats	H
Urban and Suburban Landscapes	H

Regional Importance

Distribution establishes the regional importance of a plant's impact on Michigan's natural, production, managed, and constructed systems. Use Invasiveness rank for each system and the Regional Impact rating for each ecological region from Section III. to determine regional importance. Regional importance is recorded as: high (H); medium (M); and low (L); and Insignificant (I)

Conversion table for determining Regional Importance

		Regional Impact			
		N	W	L	I
Invasiveness Rank	H	H	H	M	I
	M	H	M	M	I
	L	M	M	L	I
	I	I	I	I	I

Regional Importance

Regional Importance in five system types in each of four ecological regions.

Record the Invasiveness Rank for each system within each ecological region below.		System Type				
		Natural	Constructed Habitats	Managed Forests	Suburban/Urban	Ag/Hort/Turf
Ecological Region	WUP	M	M	M	M	M
	EUP	M	M	M	M	M
	NLP	M	M	M	M	M
	SLP	H	H	H	H	M

This information will aid in assessing and determining the overall MIPC Plan of Action.

MIPC Plan of Action

MIPC Plan of Action is based on the information obtained through this assessment. The Plan of Action is developed by the MIPC Invasive Plant Assessment Committee for review and endorsement of the MIPC Board of Directors. The Plan of Action outlines recommendation that may include one or all of the following: Education; Suppression; Restoration; and Elimination.

References

References	
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