



Michigan Invasive Plant Council

Michigan Plant Invasiveness Assessment System (MPIAS June 2008)

Genus, Species, Species subset

Scientific Name:	<i>Alliaria petiolata</i>		
Synonyms:	<i>Alliaria alliaria</i> (L.) Britt, <i>Alliaria officinalis</i> Andr. ex Bieb., <i>Erysimum alliaria</i> L., <i>Sisymbrium alliaria</i> (L.) Scop., <i>Sisymbrium officinalis</i> D.C. (from the USDA Plants Database (W-6)).		
Common Names(s):	Garlic mustard, garlic root, garlic wort, hedge-garlic, jack-by-the hedge, jack-in-the-bush, mustard root, poor-man' s mustard, sauce-alone		
Plant Type:	<input type="checkbox"/> Annual	<input checked="" type="checkbox"/> Biennial	<input 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 checked="" type="checkbox"/> Biennial	<input 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 type="checkbox"/>	Reproduces at least once per year
<input checked="" type="checkbox"/>	Can germinate in a wide range of conditions
<input checked="" 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 type="checkbox"/>	Reviewed scientific publication	<input checked="" type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level: Reproduces only by seed: Seeds can survive for 5 years in the soil.			

The seeds require a prolonged exposure to cold before germinating (W-2).

Individual plants produce 350 to 7,900 seeds (W-2).

Second year plant can produce up to 7,900 seeds per plant (Czarapata 1999).

Dense stands produce 12,500 seeds per square yard each year (W-2).

Seeds are normally dormant for 20 months (in Michigan).

The seeds remain viable for 5 years (McClay 2002, Czarapata 1999).

17,000 seedlings per square yard are growing in the fall, by spring only 25-70 (sometimes up to 375) seedlings remain (Czarapata 1999).

Viable seeds are produced within days of flowering.

It grows well in disturbed and high quality woodlands

Will tolerate sunny areas, but does not like acidic soil or long periods of drought.

Phytotoxic chemicals may interfere with growth of native species, potentially through the inhibition of mycorrhizal activity (garlic mustard does not have a fungal association) (McClay 2002). Deer will not eat the plant and consequently help spread the plant (personal communication via email with Jim Olson concerning Milwaukee Journal article, 11/23/2003).

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 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:	N

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>It will resprout if pulled off in the first year or pulled off higher than ground level in the second year. Green rosettes can survive low intensity burns especially when protected by wet litter layer. Usually there is one stalk per plant, but it can have up to 12 (especially robust plants).</p>			

I-A3. Growth Habit

Growth Habit	It has a first year rosette of 3 or 4 round, scalloped-edge dark green leaves, 2-4 in. high that remain green throughout the winter. Second year plant is 12-48 in. high, produces fruits 1-1 ½ in long, the black, oblong, ridged seed coats contain 28 seeds in a single row, up to 7,900 per plant-usually 1 flowering stalk per plant, but can be up to 12inches in robust plants.
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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 checked="" type="checkbox"/> Environmental Influences (E):	<input checked="" type="checkbox"/> Wind <input checked="" 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 checked="" type="checkbox"/> New development (construction equipment) <input checked="" type="checkbox"/> Maintenance equipment <input checked="" type="checkbox"/> Borrow material (topsoil, gravel, stone) <input checked="" type="checkbox"/> Recreation (ATV, boats, RV) <input checked="" type="checkbox"/> Dumping <input type="checkbox"/> Other (name)
<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 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>Garlic mustard seeds float and are also spread easily by hikers, bikers, plows, horses, road fill, gravel, wood chips, vehicles and traffic (Powless 2002).</p> <p>Garlic mustard seeds also float and spread easily along rivers and streams (Powless 2002).</p> <p>Garlic mustard does not need a fungal associate; therefore, the presence of earthworms is favorable to the establishment of garlic mustard because the earthworms consume fungal associates of surrounding plants (W-5.) Also, deer will not eat the plant and consequently help spread the plant (personal communication via email with Jim Olson concerning Milwaukee Journal article, 11/23/2003).</p> <p>In undisturbed areas it can spread 20-120 feet per year. Extensive human travel from southern Michigan to northern recreational areas provides a constant threat of northward expansion (W-1).</p>			

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
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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	N
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 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>Garlic mustard spreads into high quality forests (both upland and floodplain forest), not just into disturbed areas. Invaded sites undergo a decline of native herbaceous cover within 10 years-displaces many native spring wildflowers ex: spring beauty, wild ginger, bloodroot, dutchman' s breeches, toothworts, and trilliums. Also blamed for decline of the West Virginia white butterfly, chemicals in the garlic mustard seem to be toxic to butterfly' s eggs. Lack of natural predators</p> <p>The most prevalent invasions begin at wood' s edge and progresses via streams, campgrounds, and trails-seeds dispersed on mammals fur and birds, rodents (deer, horses, squirrels) by flowing water and human activities. Wind dispersal limited-most seeds fall within a few yards.</p> <p>Garlic mustard is found in old growth undisturbed forest growing 20 ft/yr up to 120 feet a year (W-2). Found at woodland edges</p>			

Now occurs in 34 midwestern states and northeastern states and Canada.

Isolated occurrences in Utah and Colorado and there are spreading populations in the Pacific Northwest (W-1). Garlic mustard spreads into high quality forests (both upland and floodplain forest), not just into disturbed areas.

Invaded sites undergo a decline of native herbaceous cover within 10 years-displaces many native spring wildflowers ex: spring beauty, wild ginger, bloodroot, dutchman' s breeches, toothworts, and trilliums. Also blamed for decline of the West Virginia white butterfly, chemicals in the garlic mustard seem to be toxic to butterfly' s eggs. Lack of natural predators. The most prevalent invasions begin at wood' s edge and progresses via streams, campgrounds, and trails-seeds dispersed on mammals fur and birds, rodents (deer, horses, squirrels) by flowing water and human activities. Wind dispersal limited-most seeds fall within a few yards.

Garlic mustard is found in old growth undisturbed forest growing 20 ft/yr up to 120 feet a year (W-2).

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 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: It can overtake native natural habitats in upland or flood plain forests, savanna, yards and roadsides within 10 years Cannot tolerate acidic soils Not commonly found in full sun, but can tolerate it. Major threat to survival of herbaceous flora and the wildlife that depends on it. Garlic mustard does not establish fungal associations used by most North American forest ground layer plants that are critical for nutrient and water uptake in many trees which gives it a competitive advantage. Alters the habitat quality for several species of salamanders and mollusca through changes in forest litter depth and composition Ground foraging birds, amphibians and reptiles may be impacted by changes in habitat quality. Also impacts soil structure			

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 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>Capable of dominating the ground cover even in dense shade (understory of North American forests).</p> <p>Invades sites independent of presence or cover of native species; species-rich sites are more likely to be invaded than species-poor (McClay 2002).</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 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>It has a first year rosette of 3 or 4 round, scalloped-edge dark green leaves, 2-4 in. high that remain green throughout the winter. These have two modes of spread: an advancing front and satellite population expansion.</p> <p>While other plants generally invade disturbed habitats, garlic mustard readily spread into high quality forests.</p> <p>Second year plant is 12-48 in. high, produces fruits 1-1 ½ in long, the black, oblong, ridged seed coats contain 28 seeds in a single row, up to 7,900 per plant-usually 1 flowering stalk per plant, but can be up to 12 in robust plants</p> <p>Dense stands produce 12,500 seeds per square yard each year (W-2).</p> <p>Normally dormant for 20 months (in Michigan).</p> <p>The seeds remain viable for 5 years.</p> <p>They are disseminated July-August.</p> <p>17,000 seedlings per square yard are growing in the fall, by spring only 25-70 (sometimes up to 375) seedlings remain (Czarapata 1999).</p> <p>Viable seeds are produced within days of flowering.</p> <p>Usually pollinated by insects, but it can self pollinate.</p> <p>Phytotoxic chemicals may interfere with growth of native species, potentially through the inhibition of mycorrhizal activity (garlic mustard does not have a fungal association) (McClay 2002).</p>			

Seeds remain viable for 5 years.

Outcompetes tree seedlings which could affect forest regeneration.

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:	spring beauty (<i>Claytonia virginica</i>), wild-ginger (<i>Asarum canadensis</i>), bloodroot (<i>Sanguinaria canadensis</i>), Dutchman' s breeches (<i>Dicentra canadensis</i>), toothworts (<i>Dentaria</i> spp.) and trilliums (<i>Trillium</i> spp.)
Global Heritage Status Rank:	
National Heritage Status Rank (U.S.):	NE
National Heritage Status Rank (Canada):	NE
Michigan Rank:	
Michigan wetland category:	facultative (equally likely to occur in wetlands or non-wetlands, estimated 34-66% probability)

Physiognomy:	adventive biennial forb
Wetness coefficient:	0
Other information:	<p>*Identify the following based upon Michigan Natural Features Inventory:</p> <p>Classification: Beech-Sugar maple-Hemlock-White pine, Hemlock-yellow birch. Natural Communities affected: Dry mesic and mesic northern forest. Rank of the Native Species: G4/S4 (Habitat type)</p>

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 type="checkbox"/>	Reviewed scientific publication	<input checked="" 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>Causes low diversity. Interferes with oviposition of rare native butterflies (Peirisnapi oleraceae, Pieris virginensis). Native hosts are toothworts (Cardamine [Dentaria laciniata] concatenata, Cardamine [Dentaria] diphylla) (McClay 2002). The eggs of Peirisnapi and Pieris are laid on garlic mustard hatch, but larvae are unable to complete development.</p>			

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 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 checked="" 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: <p>It is a weed of natural areas, so there is little direct economic damage that has been documented or described. Invasion potential and ability of garlic mustard to cause changes in forest production has not been assessed (as of 2002). Outcompetes tree seedlings which could affect forest regeneration.</p> <p>In old growth undisturbed forest is found growing 20 ft/yr up to 120 feet a year.</p> <p>Long-term presence of garlic mustard is associated with significant decline in cover of native perennial herbaceous species.</p>			

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 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: Invades the understory of undisturbed woodlands, replacing native spring flowers and it outcompetes some tree seedlings affecting forest regeneration.			

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 checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level: It does not prefer sunlight, but will survive. The plant is a biennial. The first year rosettes are sensitive to summer drought and 60-90% will die by fall if exposed to drought.			

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 checked="" type="checkbox"/>	Planting
<input checked="" type="checkbox"/>	Selection cut
<input checked="" type="checkbox"/>	Thinning
<input checked="" type="checkbox"/>	Clear cut
<input checked="" type="checkbox"/>	Whole tree
<input checked="" 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 checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level: Not applicable because garlic mustard is not used in silvicultural treatments. It can outcompete some tree seedlings, and seeds can travel on tires, animals, and wind (although not as significant). Any disturbance can create an introduction pathway, however, disturbance isn't necessary for it to gain a foothold. Seeds remain viable for 5 years.			

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 checked="" type="checkbox"/>	Seed bank
<input checked="" type="checkbox"/>	Equipment- logging, recreational, road building (skidders, harvesters, ATV's, road graders)
<input checked="" type="checkbox"/>	Borrow material (gravel, sand, topsoil)
<input checked="" type="checkbox"/>	Wildlife (mammals, birds)
<input checked="" type="checkbox"/>	People (recreational user, cars, boats)
<input checked="" type="checkbox"/>	Unauthorized dumping
<input type="checkbox"/>	Plants on adjacent sites

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>Second year plant is 12-48 in. high, produces fruits 1-1 ½ in long, the black, oblong, ridged seed coats contain 28 seeds in a single row, up to 7,900 per plant-usually 1 flowering stalk per plant, but can be up to 12 in robust plants (McClay 2002).</p> <p>Dense stands produce 12,500 seeds per square yard each year (W-2).</p> <p>Normally dormant for 20 months (in Michigan).</p> <p>The seeds remain viable for 5 years. Seeds are disseminated July-August.</p> <p>17,000 seedlings per square yard are growing in the fall, by spring only 25-70 (sometimes up to 375) seedlings remain (Czarapata 1999). Viable seeds are produced within days of flowering.</p> <p>Seeds remain viable for 5 years. It was likely introduced in the mid-1800s by settlers for food and medicinal purposes (USFWS no date).</p>			

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

Add total points		37
Rating:	≤ 5 = Insignificant (I) >5 ≤ 13 = Low (L) >13 ≤ 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 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 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 type="checkbox"/>	Observational
<input checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level: <p>Although it can grow anywhere with proper soil conditions, it prefers some shade and will die if the plant is cut off at ground level the first year before going to seed (Illinois Nature Preserves Commission 1990). Near Brevort Lake, Michigan, the plant was found within a residential lawn that had been regularly mowed, also, the 1 inch high plants had seed pods (personal communication from Linda Swartz, 8/08/2003). There is also a population present within the city limits of Marquette, Michigan (Jan Schultz personal communication, 2003). However, as of this draft (12/8/2003) no specific studies were found pertaining to the exact extent of the plant within urban and suburban areas.</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 type="checkbox"/>	Anecdotal

Comments, supportive evidence, and explanation of documentation level:

Several years of repeated burns and or hand pulling may be needed to eradicate especially in buffers and severely disturbed sites (W-3).

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: Phytotoxic chemicals may interfere with growth of native species, potentially through the inhibition of mycorrhizal activity (garlic mustard does not have a fungal association) (McClay 2002). 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"/>	Equipment
<input checked="" type="checkbox"/>	Off site plants	<input checked="" type="checkbox"/>	Topsoil/mulch/compost materials
<input 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: See previously list references			

Where found

Where is it found in the landscape?			
<input type="checkbox"/>	Ornamental beds	<input checked="" type="checkbox"/>	Open space
<input 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
<p>Comments, supportive evidence, and explanation of documentation level:</p> <p>Second year plant can produce up to 7,900 seeds per plant (Czarapata 1999).</p> <p>Dense stands produce 12,500 seeds per square yard each year (W-2).</p> <p>Seeds are normally dormant for 20 months (in Michigan).</p> <p>The seeds remain viable for 5 years (McClay 2002, Czarapata 1999).</p> <p>Seeds are disseminated July-August. 17,000 seedlings per square yard are growing in the fall, by spring only 25-70 (sometimes up to 375) seedlings remain (Czarapata 1999).</p> <p>Viable seeds are produced within days of flowering. It was likely introduced in the mid-1800s by settlers for food and medicinal purposes (USFWS no date). Garlic mustard seeds float and are also spread easily by hikers, bikers, plows, horses, road fill, gravel, wood chips, vehicles and traffic (Powless 2002).</p> <p>Occurs in upland and floodplain forests, savannas, and along roadsides. Also in shaded areas, open woodlands and disturbed sites and stream banks. Even in full sun occasionally.</p>			

Impact Subrank: Section II-C. Managed Landscapes

Add total points		19
Rating:	≤ 6 = Insignificant (I) $>6 \leq 9$ = Low (L) $>9 \leq 36$ = Medium (M) >36 = 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 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 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 type="checkbox"/>	Present in scattered areas and isolated patches (3 points)
<input checked="" 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: <p>Garlic mustard is on the noxious weed list in several states. The presence of garlic mustard as seed or rosettes in containers or field grown nursery stock may result in the rejection of plant materials or import restrictions. The harvest or commercial production of forest plants or fungi such as ginseng or morel mushrooms may also be affected (W-1).</p> <p>Winter annual weeds, such as garlic mustard, "cause crop losses by interfering with establishment and reducing yields. In many crops, they avoid our traditional weed management systems and cause extra expense to control them" (W-4).</p> <p>See previously listed references</p>			

Impact on production

Is it impacting plant/crop production?	
<input type="checkbox"/>	No impact to production (0 points)
<input checked="" 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 checked="" type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level: <p>In laboratory experiments, several compounds isolated depressed the growth system of grasses and herbs (W-2).</p> <p>"Winter annual weeds (including garlic mustard) are very successful in perennial crops like berries,</p>			

orchards, vineyards, nurseries, asparagus and turf" (W-4).

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 checked="" 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 checked="" 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: Growth cycle has several advantages: the growth periods coincide with good moisture they grow when crops are not using a lot of moisture or nutrients small size (at rosette stage) makes them inconspicuous and they may be less susceptible to traditional weed controls and timing large number of shed seeds helps plants to survive the summer 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 type="checkbox"/>	On site plant
<input type="checkbox"/>	Seed mixes
<input checked="" type="checkbox"/>	Equipment
<input checked="" type="checkbox"/>	Topsoil/mulch/compost materials
<input checked="" type="checkbox"/>	Unauthorized dumping
<input 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
<p>Comments, supportive evidence, and explanation of documentation level:</p> <p>Second year plant can produce up to 7,900 seeds per plant (Czarapata 1999).</p> <p>Dense stands produce 12,500 seeds per square yard each year (W-2).</p> <p>Seeds are normally dormant for 20 months (in Michigan).</p> <p>The seeds remain viable for 5 years (McClay 2002, Czarapata 1999).</p> <p>17,000 seedlings per square yard are growing in the fall, by spring only 25-70 (sometimes up to 375) seedlings remain (Czarapata 1999).</p> <p>Viable seeds are produced within days of flowering.</p> <p>*It was likely introduced in the mid-1800s by settlers for food and medicinal purposes (USFWS no date) however, it is not presently grown by agriculturists.</p> <p>See previously listed references</p>			

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

Add total points		20
Rating:	≤ 5 = Insignificant (I) >5 ≤ 10 = Low (L) >10 ≤ 36 = Medium (M) >36 = High (H)	

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 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 checked="" 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
Comments, supportive evidence, and explanation of documentation level: See previously listed references			

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 type="checkbox"/>	Competes and causes minor impacts on desirable plant compositions (7 points)
<input checked="" 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 type="checkbox"/>	Planting (3 points)
<input checked="" type="checkbox"/>	Seedling/plant establishment (5 points)
<input 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 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 type="checkbox"/>	On site plant
<input type="checkbox"/>	Seed mixes
<input checked="" type="checkbox"/>	Equipment
<input checked="" 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		35
Rating:	≤ 3 = Insignificant (I) $>3 \leq 10$ = Low (L) $> 10 \leq 31$ = Medium (M) >32 = High (H)	
Constructed Habitat Subrank:		H

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

Original Range (world wide)	Asia, Europe Europe; from England east to Czechoslovakia and from Sweden and Germany south to Italy, also from Asia.
Earliest possible documentation in North America	It was likely introduced in the mid-1800s by settlers for food and medicinal purposes (USFWS no date) however, it is not presently grown by agriculturists. It was first found in Ohio by 1899 and in Chicago by 1918 (Powless 2002).

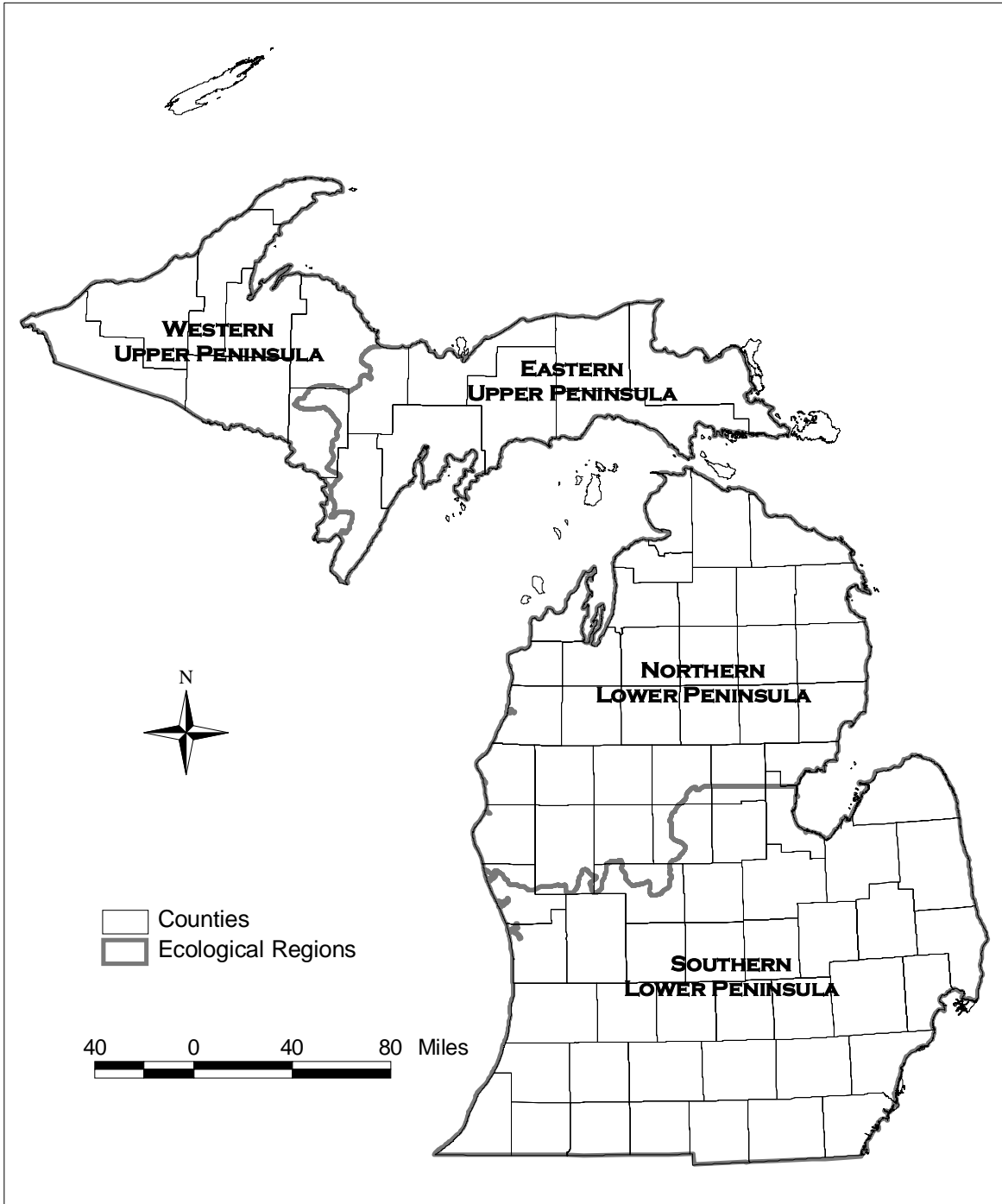
Regional Importance in Michigan

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

Within each region identify whether the plant is: (see glossary for definitions).	N (naturalized) W (widespread) L (localized) I (isolated occurrences) A (absent)
--	--

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)	W	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 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 following data from the USDA website (W-6) was based on literature, herbarium specimens and confirmed observations-not all populations have been documented:</p> <p>Upper Peninsula counties: Mackinac and Marquette (also reports of plants in Alger county-Swartz, email 2003)</p> <p>Lower Peninsula counties: Benzie, Muskegon, Kent, Ionia, Clinton, Ingham, and Berrien (USDA) (also localized documentation from Lake and Wexford counties, W-1).</p> <p>“ Extensive human travel from southern Michigan to northern recreational areas provides a constant threat of northern expansion” (Powless 2002). Found in Brevort, Pickford and Autrain in the eastern Upper Peninsula (came from a private gravel pit in the Soo) (personal emails from Linda Swartz to Jan Schultz, 07/29/2003). Also found in Saugatuck Dunes State Park and Sanctuary Woods Preserve near Holland and has spread to many parks and nature preserves in Kent and Ottawa counties (Powless 2002). Found in the Huron Manistee National Forest, Sleeping Bear Dunes National Lakeshore, Ottawa National Forest (invasive plant of concern, high priority for inventory or control),</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 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:			

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 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: Now occurs in 34 midwestern and northeastern states and Canada. Isolated occurrences in Utah and Colorado and there are spreading populations in the Pacific Northwest (W-1).			

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:			

Michigan Distribution Subrank: Section III Distribution In Michigan

Western Upper Peninsula (WUP)	L
Eastern Upper Peninsula (EUP)	L
Northern Lower Peninsula (NLP)	W
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 type="checkbox"/>	Pulling using tools
<input checked="" type="checkbox"/>	Mowing/Cutting	<input type="checkbox"/>	Stabbing
<input type="checkbox"/>	Girdling	<input checked="" type="checkbox"/>	Tilling
<input type="checkbox"/>	Soil Solarization	<input type="checkbox"/>	Flooding
<input type="checkbox"/>	Grazing	<input checked="" type="checkbox"/>	Other Black Plastic
<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>Top priority should be given to removal of satellite infestations as this is a disturbance adapted plant (trails, roads, forest edges, parking areas, and recreation sites are known sites of early infestation).</p> <p>For small infestations, hand clipping and pulling rosettes or flowering plants prior to seed set is recommended.</p> <p>Mulch or tamp down disturbed soil.</p> <p>As a side note from the state of Missouri (W-7): ground level cutting=99% mortality cutting at 4 inches (10cm) above the ground = 71% mortality and reduces the total seed production by 98%. Plants cut near ground level in full flower usually don't resprout. And viable seeds are produced even after the stems are cut so flowering stems should be removed from the site.</p>			

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 checked="" type="checkbox"/>	Observational
<input type="checkbox"/>	Other published material	<input checked="" type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level: Doug Landis, Michigan State University			

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 checked="" 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: Top priority should be given to removal of satellite infestations as this is a disturbance adapted plant			

(trails, roads, forest edges, parking areas, and recreation sites are known sites of early infestation).

For small infestations, hand clipping and pulling rosettes or flowering plants prior to seed set is recommended.

Mulch or tamp down disturbed soil.

As a side note from the state of Missouri (W-7): ground level cutting=99% mortality cutting at 4 inches (10cm) above the ground = 71% mortality and reduces the total seed production by 98%. Plants cut near ground level in full flower usually don't resprout. And viable seeds are produced even after the stems are cut so flowering stems should be removed from the site.

Fire

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

Response to fire.			
<input type="checkbox"/>	Prescribed burns*	<input checked="" 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: In wooded areas, dormant season fires are ineffective because its root crowns are protected by litter layer. Carefully timed spring fires, prior to the emergence of desirable native plants are more effective. Single dormant season or fall fire may actually increase abundance the following spring, but repeated burns (fall-spring-spring, or spring-spring-spring) have been used to maintain garlic mustard in a reduced condition and also stimulate richness and cover of herbaceous species. This fire regime did not reduce the number of woody shoots, but it did decrease their height in fire adapted oak woodlands. The same fire regime also accelerated the loss of woody seedlings (of garlic mustard) in upland, but not in lowland sites. Low density fires were extinguished by the green rosettes of the plants.			

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 checked="" type="checkbox"/>	well adapted to fire	<input type="checkbox"/>	numbers decline after fire
<input type="checkbox"/>	top killed	<input checked="" type="checkbox"/>	numbers increase after fire
<input type="checkbox"/>	sprouts readily from rhizomes	<input checked="" type="checkbox"/>	seeds survive in seed bed
<input checked="" type="checkbox"/>	killed by high intensity fires	<input checked="" type="checkbox"/>	seeds are dispersed easily in a burned area
<input 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>In wooded areas, dormant season fires are ineffective because its root crowns are protected by litter layer. Carefully timed spring fires, prior to the emergence of desirable native plants are more effective. Single dormant season or fall fire may actually increase abundance the following spring, but repeated burns (fall-spring-spring, or spring-spring-spring) have been used to maintain garlic mustard in a reduced condition and also stimulate richness and cover of herbaceous species. This fire regime did not reduce the number of woody shoots, but it did decrease their height in fire adapted oak woodlands.</p> <p>The same fire regime also accelerated the loss of woody seedlings (of garlic mustard) in upland, but not in lowland sites. Low density fires were extinguished by the green rosettes of the plants.</p>			

Control Method Subrank: Section IV: Control Method Subrank

Method	Score	Method	Score
Mechanical	A	Chemical	A
Biological	UD	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:			

Management Potential Subrank: Section V-A Management Potential

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

V-B MANAGEMENT ACTIVITY

Given the current state of knowledge regarding control methods, are activities being employed to suppress or eradicate this plant in Michigan.		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
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 type="checkbox"/>	Observational
<input type="checkbox"/>	Other published material	<input type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level:			
Herbicide, mechanical and fire			

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 type="checkbox"/> YES	<input checked="" 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 checked="" 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:			
It was original use as a medicinal herb but is not longer in commerce			

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 type="checkbox"/> YES 5 points	<input checked="" type="checkbox"/> NO 0 points
This plant is use in public landscapes	<input type="checkbox"/> YES 5 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:			

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 type="checkbox"/> YES 5 points	<input checked="" 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 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 checked="" type="checkbox"/>	Observational
<input type="checkbox"/>	Other published material	<input checked="" type="checkbox"/>	Anecdotal
Comments, supportive evidence, and explanation of documentation level:			

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 type="checkbox"/> YES 5 points	<input checked="" 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 type="checkbox"/> YES 5 points	<input checked="" type="checkbox"/> NO 0 points
This plant provides value added benefits in soil and water conservation	<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:			

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	0	0	0
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	H
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	H	H	H	H	H
	SLP	H	H	H	H	H

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 recommendations that may include one or all of the following: Education; Suppression; Restoration; and Elimination.

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