

# Michigan Plant Invasiveness Assessment

## *Authors*

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## *Introduction*

Invasive plants threaten all of Michigan's ecosystems from natural areas, managed forests and agricultural production fields to the built landscape. Members of the Michigan Invasive Plant Council (MIPC) share a concern about the effects of invasive plants in our state and as a result initiated work on an assessment system tailored to Michigan's environmental conditions and the diversity of its natural, managed and built landscapes.

The objective of this assessment is to identify relevant biological, ecological, management and economic information that will aid in the evaluation of the impact any given plant may have on our Michigan ecosystems and become the foundation of an accompanying Michigan Invasive Plant Council recommended plan of action.

## *Contents of the assessment*

The assessment has seven sections. The first six provide information that leads to the MIPC Plan of Action. The sections were developed to evaluate plant characteristics, identify biological and economic impacts (both positive and negative), and assemble the necessary information to make an informed decision. Each section is outline below.

## *Section I – Biological Character*

### **Reproductive ability and Dispersal**

*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 (S) and vegetative (V) reproductive characteristics.

*Dispersal* identifies the vectors or agents of dispersal and the likelihood of long distance dispersal. Dispersal agents are environmental influences (E) such as wind and water; wildlife (W) both mammals and birds; domestic animals (DA) both mammals and birds; and human activity (H). Dispersal distance refers to the potential for long distance dispersal (LD).

Dispersal is reported as: insignificant (I) (one or two vector categories; little potential for long-distance dispersal); low (L) (three or four vector categories; little potential for long-distance dispersal); medium (M) (one or two vector categories; great potential for long-distance dispersal); high (H) (three or four vector categories; great potential for long-distance dispersal).

## *Section II – Impact*

*Impact* identifies the plant's ecological, aesthetic, economic influence on natural areas, constructed habitats, managed landscapes, and production systems. Questions on impact are tailored to the individual characteristics and composition of each of the respective systems. Points are associated with each question with the total used to classified impact as high (H), medium (M), low (L), or insignificant (I).

## *Section III – Distribution*

*Distribution* identifies known occurrences of this plant. It indicates the area of origin for the plant (Original Range) and the earliest documented occurrence in North America. Then, for Michigan, identifies the extent to which the plant is reported to be a problem in each of four ecological regions (Albert 1995). The four ecological regions of Michigan have been delineated

based on broad climatic, geologic, edaphic, and vegetation patterns, and provide a more meaningful framework for assessing invasiveness than geopolitical boundaries.

Michigan ecological regions are Western Upper Peninsula (WUP), Eastern Upper Peninsula (EUP), Northern Lower Peninsula (NLP), and Southern Lower Peninsula (SLP). Plant occurrence as a problem is classified as naturalized (N), widespread (W), localized (L), isolated (I), or absent (A).

#### ***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).

#### ***Section V – Control effort***

*Control effort* identifies control potential (investment in human and financial resources) and management activity (programs being presently conducted). For most statements, no particular methods of control are specified; however, responses should relate to the methods most likely to be used (refer to section IV). Control potential considers feasibility, costs and unavoidable non-target damage. Control potential is identified as high (H) or low (L) based on point associated with a series of questions.

Management activity identifies current programs being employed to eradicate or suppress this plant in the public and private arenas. Management activities being employed (E) or not employed (NE) is followed by a letter indicating the sector involved: federal (F), state (S), municipal (M), non-profit organization (O) and commercial (C).

#### ***Section VI – Value within the state of 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.

#### ***Section VII – Summary table, invasiveness rank, 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 through VI to establish a summary table, an invasiveness rank (based on potential invasiveness and impact for each system within the four ecological regions), a MIPC plan of action and a plant summary report.

#### ***Invasiveness rank***

The plant's *invasiveness rank* is based on *potential invasiveness* (sum of Biological Character) and *impact* and determined for each system within each of the four ecological regions.

*Potential invasiveness* is based on biological characteristics that may predispose a plant to invasive behavior. *Reproductive ability* (seed and vegetative) + *dispersal* = *potential invasiveness*.

*Impact* is the expression of potential invasiveness under a given set of environmental conditions within a system (natural system, forest production, ag/ hort/ turf production, constructed habitats, and urban and suburban landscapes). Impact may vary among or in some cases 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.

*Potential invasiveness* and *impact* are coupled to identify a plant's *invasiveness rank* in each system (natural; managed forests; suburban and urban landscape; ag/ hort/ turf production) within each of Michigan's four ecological regions.

*Invasiveness rank* 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 the 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.

### ***Education***

Educational efforts are directed at informing property owners/managers of the problems associated with the presence or use of this plant. Education will be tailored for the specific details associated with the system(s) impacted (natural system, forest production, ag/ hort/ turf production, constructed habitats, and urban and suburban landscapes) and the plant in question. Education can refer to other action plans such as suppression, restoration and elimination in addition to suggestions on use and sanitation. The following sub-categories are identified to address use more specifically: No – do not use this plant; Avoid – avoid the use of this plant; Caution – caution, prevent the escape of this plant; and OK – not considered a problem at this time.

### ***Suppression***

Recommendations call for the development of management plans to suppress or eradicate this plant in problem areas. Suppression/eradication may be widespread (across multiple areas) or limited to its occurrence in specific problem areas. MIPC does not endorse any specific control method; however it encourages the property managers to develop a plan that fits within their overall management objectives and desired outcome.

### ***Restoration***

Management efforts may require restoration of the site to minimize reoccurrence of invasion and aid in the reestablishment of desirable plants. Restoration plans should be specific to the site (natural, managed, constructed, production) and the desired outcome.

### ***Elimination***

This recommendation calls for the plant's potential elimination from commerce. Plants may be directly (primary crop or desirable plant) or indirectly (weed seed, impurity or by-product) introduced through commerce. Based on the assessment, the plant in question poses problems in multiple systems and has no or limited determined economic, aesthetic or environmental value.

### ***Plant summary report***

Plant summary report will include:

1) Plant name (scientific and common). 2) Invasiveness rank for each system within Michigan's four ecological regions. 3) MIPC plan of action (education, suppression, restoration, elimination). A plant summary report will be published for each plant that has gone through the Michigan Invasive Plant Assessment System. All information used in developing the plant summary report and MIPC's plan of action will be accessible through the Michigan Invasive Plant Council.

For a complete copy of the assessment tool, contact the Michigan Invasive Plant Council Website at: <http://forestry.msu.edu/mipc/>

As of September 2004, about a dozen plants have been partially run through the assessment tool. As plants are evaluated, all information and the resultant MIPC plan of action will be posted on the website.

### ***Michigan Invasive Plant Council***

Executive Order 13112, signed by the President of the United States on February 3, 1999, directs federal agencies and all agencies accepting federal funds to work cooperatively with stakeholders to prevent the introduction of, and to control, invasive species on public and private lands. A logical first step was to form a statewide Invasive Species Council.

The first meeting of the council was hosted by the U.S. Forest Service. Everyone attending the first council meeting agreed that: 1) working cooperatively across political boundaries and with the private sector to provide information about invasive plant species is critical to stemming the invasive tide; 2) providing a forum and a clearing house for education on the impacts, status and control of invasive plants is an important role for agencies and organizations to play together.

Today, council members include representatives from several state, federal and local agencies, colleges, universities, professional plant industries, private individuals and conservation organizations with the intent to promote the exchange of information about invasive plants and encourage responsible solutions. The Michigan Invasive Plant Council welcomes people interested in invasive plant issues in Michigan. For membership information please contact: <http://forestry.msu.edu/mipc/>

### ***Acknowledgements***

This assessment system is adapted from several assessment tools currently being used and/or developed for the evaluation of invasive potential and the categorization of invasive plants. We appreciate the efforts of these authors in addressing invasive plant assessment and for being able to use their models as a guide in the development of the Michigan Plant Invasiveness Assessment System.

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