Massachusetts Invasive Plant Advisory Group

April 28, 2025

Taryn LaScola-Miner
Director, Crop & Pest Services
MA Department of Agricultural Resources
251 Causeway Street, Suite 500
Boston, MA 02114

Dear Taryn,

The Massachusetts Invasive Plant Advisory Group (MIPAG) is writing to request that the Massachusetts Department of Agricultural Resources add the species listed below to its regulated invasive plant list. As you know the first 66 species reviewed by MIPAG in 2002-2004 were listed as regulated in 2006 under new rules established in 2005 to ban or phase out the importation, propagation, and sale in the Commonwealth of more than 140 plants identified as either noxious and/or invasive in the Commonwealth. In December 2024 and March 2025 MIPAG evaluated and determined the following species to be invasive:

Miscanthus sinensis Anderss. (Chinese silvergrass; Eulalia) – designated as **Invasive**

> A tall ornamental bunch grass with showy flower and seed heads and a silver vein that goes down the middle of each leaf blade. It can be found in variety of habitats from full sun to part shade and does particularly well on road, habitat edges, and in grasslands in coastal and island counties. It grows in dense bunches and is rhizomatous as well as seed dispersing.

Rhodotypus scandens (Thunb.) Makino (Jetbead; White Kerria; Jetberry bush; Black Jetbead) – designated as **Likely Invasive**

> A perennial deciduous shrub with multiple stems and showy white four-petaled flowers. Fruits grow in clusters of 1-4 and appear red before maturing into shiny, black bead like fruits. It can be found in full sun to forest understories and tolerates a wide range of soils. Jetbead can spread both by seed and vegetatively through layering.

Phase Out Period

MIPAG would also like to recommend that MDAR consider following past procedures by allowing a phase out period for any regulated plants that are in the horticultural trade. In the original (2006) listing of regulated species, the phase out period was three years for trees, two years for shrubs and one year

for herbaceous plants. More recently, phase out periods were instituted for Pinus thunbergii, Mycelis muralis, and Pyrus calleryana when these species added to the prohibited plant list.

More information on the process and designations can be found on our website: *www.massnrc.org/**mipag**/*.

If you would like to discuss this further, please contact me at brian.keevan@mass.gov

Sincerely,

Brian Keevan
MIPAG Chair

cc: Karen Lombard

SPECIES: *Miscanthus sinensis*

STATUS: Invasive

NON-NATIVE INVASIVE PLANT WORKSHEET

MASSACHUSETTS CRITERIA FOR EVALUATING NON-NATIVE PLANT SPECIES FOR INVASIVENESS

The Massachusetts Invasive Plant Advisory Group (MIPAG) defines invasive plants as "*non-native species that have spread into native or minimally managed plant systems in Massachusetts. These plants cause economic or environmental harm by developing self-sustaining populations and becoming dominant and/or disruptive to those systems.*" As defined here, "species" includes all synonyms, subspecies, varieties, forms, and cultivars of that species, unless proven otherwise by a process of scientific evaluation.

The following criteria are being used to objectively evaluate and categorize plant species suspected of being, or with the potential to become, invasive in Massachusetts. They were originally developed in 2005 by the George Safford Torrey Herbarium at the University of Connecticut and a subcommittee of the Massachusetts Invasive Plant Group representing science, nursery, and conservation professionals. They were updated by MIPAG in 2022 to include climate change considerations and other minor clarifications.

The criteria enable the separation of plants into the following categories:

- *Invasive Plants* in Massachusetts
- *Likely Invasive Plants* in Massachusetts
- *Potentially Invasive Plants* in Massachusetts (species not currently known to be naturalized in Massachusetts, but that can be expected to become invasive within minimally managed habitats within the Commonwealth)

For a species to be included on the list of species determined to be **Invasive, Likely Invasive or Potentially Invasive** in Massachusetts, it must be substantiated by scientific investigation (including herbarium specimens, peer-reviewed papers, published records and other data available for public review) to meet specific criteria. The process of reviewing individual plant species for their invasiveness in Massachusetts is ongoing and may result in a change in status pending new data and further review.

Tabular summary of criteria to be met

	Criteria that must be met
Base criteria	1-4
Invasive	1-9
Likely Invasive	1-5, at least one of 6-9, at least one of 10-12
Potentially Invasive	1-4 (not 5), 13-15

Note: For citations below refer to Species Information Sheet

For a species to be designated as "INVASIVE," "LIKELY INVASIVE" or "POTENTIALLY INVASIVE" it must meet certain base criteria (#1-4 below). The species must:

1. Be nonindigenous to Massachusetts.

Yes *No*

Comment: **Native to east Asia. The earliest record in Massachusetts is from 1916 in Suffolk County. [1, 3]**

2. Have the biologic potential for rapid dispersion and establishment in minimally managed habitats

Yes *No*

Comment: **This species has the potential to produce many thousands of seeds, establish persistent rhizomes, and is well adapted to a wide range of habitat types. [1, 3]**

3. Have the biologic potential for dispersing over spatial gaps away from the site of introduction.

Yes *No*

Comment: **Seeds are wind dispersed and have been shown to travel far from the parent plant. One study found several established populations of *M. sinensis* 570-3000m away (0.35-1.86 miles) from escaped ornamental plantings [5]. Another study found that seeds regularly disperse up to a quarter mile away from the parent plant [4].**

4. Have the biologic potential for existing in high numbers away from intensively managed artificial habitats

Yes *No*

Comment: ***M. sinensis*** **regularly establishes in natural environments more than 0.5 miles away from where it is cultivated [5]. This plant is also adapted to a wide variety of ecosystems without human intervention (e.g. adapted to nutrient poor soil, well-draining soil, full and partial sun, etc.). *M. sinensis* is able to rapidly increase its population size through seeds that are annually produced in the thousands and rhizomes that can branch up to 3 times/year. [1]**

If a species does not meet all four of the previous criteria, stop here. The species cannot be listed at this time. If a species meets all four, go on to #5.

5. The species is naturalized in Massachusetts (persists without cultivation in Massachusetts)

Yes *No*

Comment: **There are naturalized populations of *M. sinensis* throughout Massachusetts currently and this species has been in Massachusetts since early 1900's with several naturalized populations being reported by the 1970's. [3]**

If a species meets Criteria 1-4 and Criterion 5, it may be considered "INVASIVE" or "LIKELY INVASIVE" in Massachusetts. Go to Criteria 6-9.

If it does not meet Criteria 5, it may be considered "POTENTIALLY INVASIVE" if it meets Criteria 13-15.

6. The species is widespread in Massachusetts, or common in a region or habitat type(s) in the state.

Yes *No*

Comment: **There are naturalized populations found in Dukes, Nantucket, Barnstable, Bristol, Worcester, Hampshire, Middlesex, Plymouth, Norfolk, and Essex counties. There are also research grade observations (iNaturalist) of *M. sinensis* in Suffolk, Franklin, and Berkshire counties, but it is difficult to determine how many of these observations are cultivated or naturalized specimens. The large spread of *M. sinensis* throughout Massachusetts shows just how adapted it is to a wide variety of habitats.**

7. The species has many occurrences in MA that have high numbers of individuals in minimally managed habitats.

Yes *No*

Comment: ***M. sinensis* is typically found in high numbers and dense patches in natural environments. [See photos in Species evaluation form & iNaturalist]**

8. The species is able to out-compete other species in the same natural plant community.

Yes *No*

Comment: ***M. sinensis* creates very dense patches that prevent the establishment of other plant species in the same area. Litter from this species is also known to decompose slowly which can further prevent the establishment of other species particularly in areas that are not fire managed [1,5]. It has invaded the globally rare**

sandplain grasslands and other sites with known rare plant populations. [iNaturalist]

9. The species has the potential for rapid growth, high seed or propagule production and dissemination, and establishment in natural plant communities.

Yes *No*

Comment: ***M. sinensis*** **is well adapted to a wide range of ecosystems making it able to persist in areas that are not being managed and establish in a wide variety of locations. An individual** ***M. sinensis*** **can also produce up to 140,000 seeds/m^2 in one year and establishes a robust rhizome that will continue to produce shoots unless completely taken out of the ground or sprayed with herbicide. [1,7]**

If a species meets the initial five Criteria and Criteria 6-9 it may be considered an "INVASIVE" species in Massachusetts.

If a species meets the initial five Criteria, but does not meet all of Criteria 6-9 at this time, it may be considered a "LIKELY INVASIVE" species in Massachusetts if in addition it meets at least one of the following three Criteria (#10-12).

10. The species has at least one occurrence in Massachusetts that has high numbers of individuals forming dense stands in minimally managed habitats.

Yes No

11. The species has the potential, based on its biology, colonization history outside its native range, and likelihood of range expansion or change in biologic potential from climate change predictions, to become invasive in Massachusetts.

Yes No

12. The species is acknowledged to be invasive in nearby states, but its status in Massachusetts is unknown or unclear. This may result from lack of field experience with the species or from difficulty in species determination or taxonomy.

Yes No

If the species meets the basic criteria for invasiveness (Criteria 1-4) but is not naturalized in Massachusetts (Criterion 5), the species may be considered "POTENTIALLY INVASIVE" in Massachusetts if it meets the following three criteria (#13-15):

13. The species, if it becomes naturalized in Massachusetts, based on its biology and biologic potential, would pose an imminent threat to the biodiversity of Massachusetts **and**

Yes No

14. Its naturalization in Massachusetts is anticipated, **and**

Yes No

15. The species has a documented history of invasiveness in other areas outside its native range including expansion of range and/or change in biological potential from climate change predictions.

Yes No

Completed by: Sarah Bois and Jenny T. Kafas, Linda Loring Nature Foundation, 2/28/25

Decision by MIPAG and date: Voted as Invasive 3-13-25.

DEFINITIONS* TO ACCOMPANY
"CRITERIA FOR EVALUATING NON-NATIVE PLANT SPECIES FOR INVASIVENESS IN MASSACHUSETTS"

Biologic potential - The ability of a species to increase its number, either sexually and/or asexually.

Invasive plants - Non-native species that have spread into native or minimally managed plant systems in Massachusetts. These plants cause economic or environmental harm by developing self-sustaining populations and becoming dominant and/or disruptive to those systems. *As defined here, "species" includes all synonyms, subspecies, varieties, forms, and cultivars of that species unless proven otherwise by a process of scientific evaluation.*

Indigenous species - A species that occurs natively in Massachusetts. Indigenous species often have a pre-colonial presence (pre-1500) or have arrived in the region more recently without the aid of human intervention. Synonymous with native species.

Intensively managed habitats - Intensively managed habitats are habitats or land systems where management efforts and investments of time, money and labor occur frequently. Examples include manicured lawns, landscaped grounds, gardens, roadsides or agricultural lands for crops or livestock.

Likely Invasive plants - Non-native species that are naturalized in Massachusetts and meets some but not all criteria that would trigger an "Invasive plant" designation.

Minimally managed habitats - Minimally managed habitats are habitats where management efforts and investments of time, money and labor are infrequent or non-existent. These habitats may have been intensively managed for anthropogenic reasons at one time in their history. In some instances, management may be more intense, but management is done for conservation purposes and is primarily aimed at

preserving elements of biological diversity such as imperiled species or critical natural communities. Minimally managed habitats are similar to "natural areas" but the distinction is made in order to remove bias, misconceptions or ambiguities that surround the term "natural area".

Non-indigenous species - A species that is not native or naturally occurring (based on its biology, phylogeny, distribution and current knowledge about the species) within Massachusetts. A species may be indigenous to North American but non-indigenous in Massachusetts. Synonymous with non-native species.

Naturalized species - A non-indigenous taxon that occurs without the aid and benefits of cultivation in Massachusetts. Further, it implies two biological points: it freely and regularly reproduces in the wild, sexually or asexually, and occurrences persist over time.

Natural plant community - A natural plant community is an association or assemblage of plant species that repeatedly occur together in re-occurring patterns in a specific type of habitat. This assemblage can be characterized by dominant species and biological properties. A natural plant community implies a minimally managed situation where all or most of the species that make up the assemblage are indigenous to the defined area.

Occurrence - Existing example of a species on the landscape.

Potentially invasive plants - Non-native species not currently known to be naturalized in Massachusetts, but that can be expected to become invasive within minimally managed habitats within the Commonwealth.

Spatial gaps - This term is used in reference to the ability of a species to disperse away from existing occurrences. The concept of crossing spatial gaps is used to distinguish those species that can disperse over discontinuities and become established elsewhere, from species that spread across a habitat only by continual, uninterrupted growth.

**There are no definitions for certain terms (e.g. widespread or high numbers) with the intent that discussion within MIPAG will be used to determine the outcome, given that we do not have perfect information.*

Species Information

***Miscanthus sinensis* Anderss.**

TAXONOMY

Family: Poaceae

Summary*:*

Miscanthus sinensis, also called Chinese silvergrass and Eulalia, is a tall perennial bunch grass that flowers from August to November. This plant is popular in landscaping due to its easy maintenance, showy flower and seed heads, and tall bunched growth. There are more than 50 cultivars being sold in the US with a diversity of variegation, but most, if not all, varieties have a silver vein going down the middle of each blade.

M. sinensis is adapted to a wide range of habitats growing successfully in well-draining and moist soils with a pH of 2.7-6.8, and in full sun to partial shade areas in its native range, with seeds able to germinate in soils with a pH range of 4.3-8.5 [1]. *M. sinensis* will create very dense bunches each 1-3.75 ft^2 with 98-339 shoots each and is rhizomatous as well as seed dispersing; their rhizomes can branch up to 3 times/year, and they regularly produce up to 8,000 seeds/m^2 in Japanese grasslands, but in warmer climates with high precipitation within their native range they can produce up to 140,000 seeds/m^2 [1].

Being self-incompatible, *M. sinensis* is generally considered sterile; however, there are over 50 varieties commonly sold in the US that can hybridize with each other and produce viable seeds [11]. With even 10 percent seed viability – a threshold many, if not most, varieties are well above – one individual can produce hundreds of viable seeds with that number likely increasing to over 1,000 if growing conditions are ideal [11,13]. Some cultivars are known to produce upwards of 200,000-300,000 viable seeds per plant [11, 14]. A study by the Chicago Botanic Garden (CBG) found that for *M. sinensis* cultivars, viable seeds per plant ranged from 138 to 349,327 [11]. The CBG included this data in their evaluation study of hardy ornamental grasses and stated, “Cultivars of *Miscanthus sinensis* were by far the most prolific seeders” [15].

Native Region or Range:

M. sinensis is native to Asia with its range going north to the Kuril Islands and south to the Philippines occupying Taiwan, Japan, the Korean peninsula and parts of eastern China in between. In its range it is typically a dominant grassland species and is occasionally dominant in forest understories. It is well adapted to ecosystems ranging from sub-arctic to tropical [1].

HISTORY

M. sinensis has been introduced globally as an ornamental plant and more recently for biofuel production. It is currently widespread in its native range, as well as in North America, Europe and New Zealand, and is present on all continents except Antarctica [2]. *M. sinensis* has been introduced to the United States on several occasions with known introductions in Pennsylvania in 1879, North Carolina in 1893, and Washington DC in 1894. A nursery in Asheville, NC had *M. sinensis* for mail order starting in 1907 which resulted in more introductions around the country. By 1913 there were naturalized populations in New York, Florida, and Washington DC and in West Virginia by the 1940's [7]. The introduced range of *M. sinensis* includes forty U.S. states (based on EDDMapS records and iNaturalist data (Figure 1).

The introduction of *M. sinensis* to Massachusetts was likely for ornamental purposes. The earliest records of naturalized populations of *M. sinensis* were found in 1916 and 1917 (Suffolk and Worcester counties respectively). By 1969 *M. sinensis* was more widely seen around the state where it was then also found in Hampshire, Bristol, and Barnstable counties [3].

BIOLOGY

Life Form – Graminoid

Naturalized - Yes

Dispersal – Wind

Massachusetts habitats – Open habitats including road edges, edges of shrub habitats, and sandplain grasslands and heathlands. Some understory forests where it was observed invading from the outside edge.

Biological potential –

M. sinensis is often found in disturbed habitat and grasslands, but is adapted to a variety of habitats. Specifically, it is commonly seen in full-sun areas, but is adapted to partial shade and has also been seen in forest understories in its native and invaded ranges. It has been found to germinate in temperatures ranging from 59 to 90 degrees Fahrenheit, germinating in soils with a pH of 4.3 to 8.5, and will grow in moist to well-draining soil as well as a large range of soil textures [1]. These features give *M. sinensis* the potential to establish in many of Massachusetts' habitats with establishment already being seen throughout including the globally rare sandplain grassland that supports many rare and endangered plants and in ecologically sensitive wetland buffers [1, 2].

M. sinensis is successful at reproducing and self-propagating by seed. In Japanese grasslands, *M. sinensis* produces 535 to 8,000 seeds/$m^{2.}$; seed production increases to up to140,000 seeds/m^2 in warm areas with high levels of precipitation [1]. However, some

cultivars have been shown to produce 200,000-300,000 viable seeds per plant [11, 14]. Seed production/ m^2 of *M. sinensis in the northeast* could potentially increase in the coming years as it is projected that both temperature and precipitation levels in our area will increase with global climate change [6]. *M sinensis* is still widely sold as an ornamental plant with much of the appeal of this plant arising from its beautiful seed heads and fall phenology. The plants that are sold result in the continuous input of seeds into natural environments evidenced by *M. sinensis* being found to establish up to 3 km (1.86 miles) away from ornamental plantings [5] and regularly spreading 0.25 miles away from the parent plant [4]. Research has shown that nursery introductions can perpetuate current and future invasion risk [14]. On Nantucket Island, conservation organizations have observed numerous *M. sinensis* plants establishing far from cultivated populations in landscaped yards and spreading within natural areas likely via long distance wind dispersal and movement by brush cutting machinery used in early successional habitat management (*personal obs*).

REPORTED INVASIVENESS

M. sinensis is not currently regulated in any New England State. However, *M. sinensis* is listed as Invasive with the caveat of only being present in localized areas (non-regulatory) for Rhode Island, as Potentially Invasive (not prohibited) for Connecticut, and is on a watchlist for New Hampshire. It is also listed as Invasive (and regulated) in New York state and seen as an invader of the Mid-Atlantic by the National Parks Service and the U.S. Fish and Wildlife service. In the following eastern states, *M. sinensis* is considered invasive by leading invasive groups in that state (primarily invasive species councils) but is not regulated or prohibited at the state level: NJ, PA, DE, VA, WV and MD (Figure 2).

M. sinensis is seen as a major invader of the southeast. It is recognized at the state level (primarily by state invasive species councils) for several states (invasive in GA, KY, TN, NC and watch-listed for AL) and seen as an invader at the federal level by the USDA Forest Service's regional task force for southern forests. Its invasiveness in this region indicates a high likelihood of invasiveness in Massachusetts in the coming years as the climate of these states closely resembles the climate we are expecting to experience in the near future as predicted by NOAA [6].

In New York State (the iMap Invasives database) there is detailed documentation from state parks in Long Island (a climatic envelope similar to the south coast of Massachusetts as well as Cape Cod and the Islands). These invading populations illustrate the density of *M. sinensis* possible if left unmanaged (images below).

Escapes of *M. sinensis* from cultivation have also been noted by the European and Mediterranean Plant Protection Organization in Austria, Belgium, Czech Republic, France, Georgia, Germany, Italy, Russia, Switzerland, Spain, and the United Kingdom. This organization has put out a call for risk analysis on its invasive behavior before continuing to plant it. [8]

DISTRIBUTION

Presence in Massachusetts Counties

BE	FR	HS	HD	WO	MI	ES	SU	NO	BR	PL	BA	DU	NA
?	?	X	X	X	X	X	X	X	X	X	X	X	X

There are naturalized populations found in Dukes, Nantucket, Barnstable, Bristol, Worcester, Hampshire, Middlesex, Plymouth, Norfolk, and Essex counties. There are also research grade observations (iNaturalist) of *M. sinensis* in Suffolk, Franklin, and Berkshire counties, but it is difficult to determine how many of these observations are cultivated or naturalized specimens. In all three instances their presence shows the ability of *M. sinensis* to grow in these areas and they are likely seed sources for current or future local populations. [2,3,19]. Counties with herbarium records include: Barnstable, Bristol, Dukes, Hampden, Hampshire, Nantucket, Norfolk, Suffolk, and Worcester [20].

SPREAD & IMPACTS

Several reputable resources for managing invasive plants have posted management strategies for *M. sinensis* online indicating that there have been substantial concerns around management of this species in many areas of the US [1].

On Nantucket Island, there have been continuous management efforts to remove *M. sinensis* made by the Nantucket Islands Land Bank (NLB), the Nantucket Conservation Foundation (NCF), and the Linda Loring Nature Foundation (LLNF) at several sites around the island since 2019 (see Figure 3 showing areas where *M. sinensis* is a problem at NCF and some conservation partner properties. NCF has substantially increased the number of worker-hours per year dedicated to hand-removal of the species, yet all sites still continue to require removal of new plants, and the number of sites being managed remains high, with new sites being observed and added to management plans each season:

Year	Number of Sites	Approx work hours	Site completed?
2020	5 (Shawkemo Rd, Russells Way, New South Rd, Windswept, Almanac Pond Rd)	6	No
2021	3 (Norwood, Windswept, Russells Way)	8	No
2022	2 (Windswept, Russells Way)	4	No
2023	4 (Russells Way, Norwood, Windswept, Altar Rock Rd, Caterpillar Trail)	18.5	No
2024	6 (Flying Farm Field, Russells Way, New South Rd, Windswept, Milestone Bog)	21	No

Other conservation groups on Nantucket (NLB and LLNF) have noted a similar increase in person-hours dedicated to the hand-removal of *M. sinensis* to prevent take-over of the species in certain areas.

Density

M. sinensis has the capacity to form dense stands when left unmanaged. On Nantucket Island, MA, a majority of the invaded sites are being actively managed to prevent dominance. However, one area (the Nanahumacke Preserve) has been left unchecked and has formed extensive dense stands throughout an open, unmanaged field with individual clumps spreading into the nearby pitch pine woodland (Figure 4). The Nanahumacke Preserve is under a Conservation Restriction administered by Nantucket Land and Water Council. The past history of this site includes use as a dumping ground for landscape waste, and the area of the property under easement has been used only for passive recreation and otherwise left undisturbed. The site is not known to have been landscaped. Photos of these stands show plants spreading in large patches (Figures 5 and 6).

Outside of Massachusetts, nearby states have documented similarly dense patches. New York's iMaps Invasive database documents dense stands of invading *M. sinensis* in natural areas of Long Island. Heckscher State Park has documented high density areas that are nearly monocultures (Figures 7 and 8). Originally documented in 2014 and 2015, these patches have remained dense and dominant at this site. The ecological similarity between these natural areas on Long Island with the South Coast, Cape Cod, and coastal islands of Massachusetts indicates the potential for *M. sinensis* to dominate an area when left unmanaged.

Minimally managed areas on Nantucket such as shrublands and grasslands managed for early successional habitat have been colonized by *M. sinensis* where it establishes and competes well in harsh sites and in competition with native clonal shrubs and tall native grasses (Figures 9 and 10).

M. sinensis is a known fire hazard due to the slow decomposition of the leaves, high flammability, and ability for their fires to reach very high temperatures (16, 17, 18). This presents an added risk to structures, especially when growing near homes and businesses. *M. sinensis'* dense growth form and height may increase fire risk compared with smaller and less dense native grasses and forbs [9].

As of 2/10/25, iNaturalist lists 244 observations of *M. sinensis* from Massachusetts throughout the state with the largest concentrations documented in Nantucket, Martha's Vineyard, Cape Cod, and Boston areas and along the Connecticut River Valley. EDDMapS (2025) has 98 observations in Massachusetts. It is important to note that in EDDMapS, one point can represent multiple individual plants. These records were predominantly found in minimally managed habitats and confirmed as such where possible – conservation lands, town-owned open spaces, bike paths, parks, and road edges.

M. sinensis was previously evaluated by MIPAG in 2004. At that time, it was determined that *M. sinensis* did not meet the criteria for invasiveness in Massachusetts. It was recommended that more data was needed specifically for minimally managed habitats.

Since that time, many additional records have been added, and more states have added *M. sinensis* to their invasive watch lists.

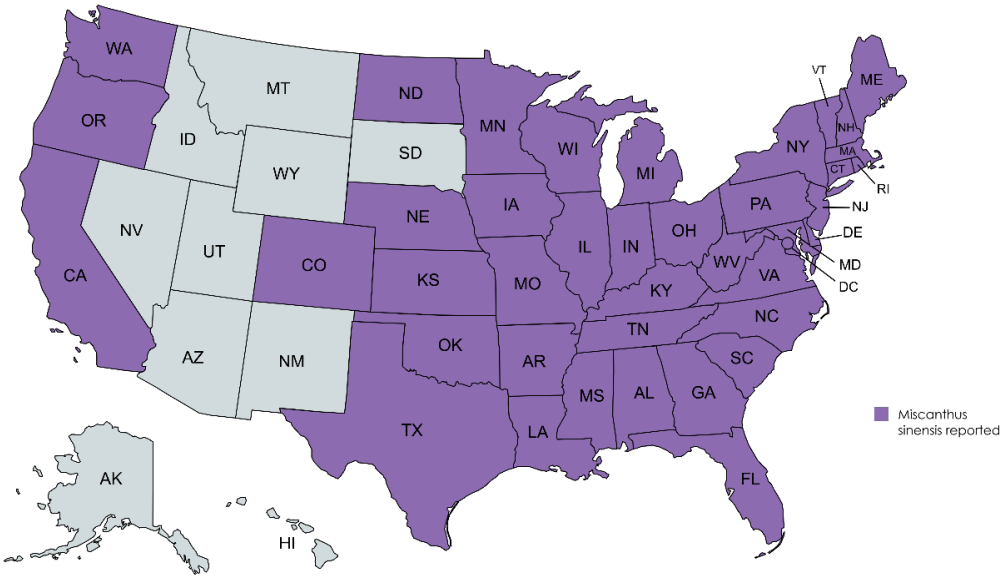

Figure 1. Introduced range of *M. sinensis* in U.S. (based on EDDMapS and iNaturalist data).

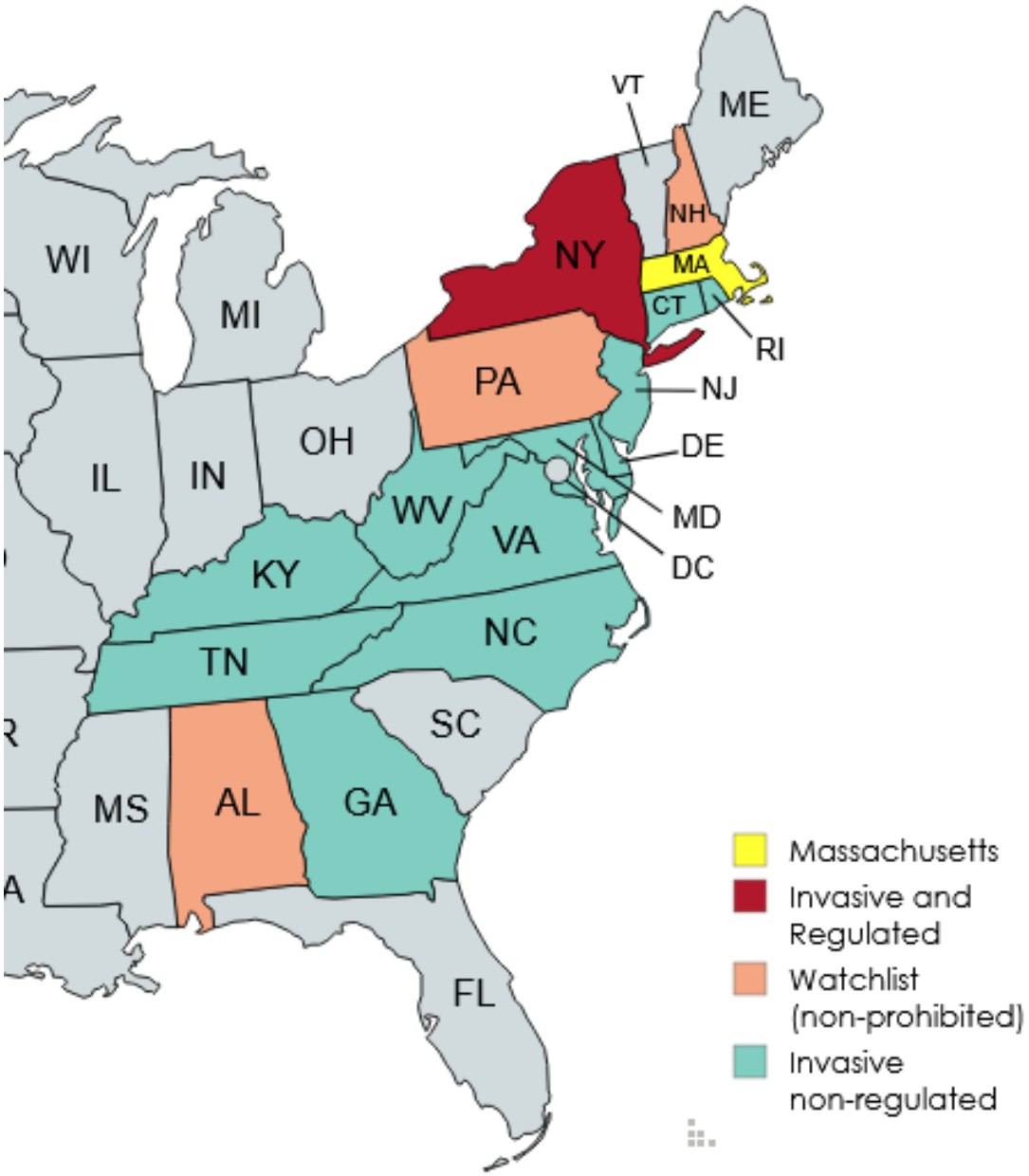

Figure 2. Where *M. sinensis* is considered invasive and is regulated (dark red), considered invasive by non-regulatory group (light teal), or watchlist/under evaluation (light red) in states east of the Mississippi River.

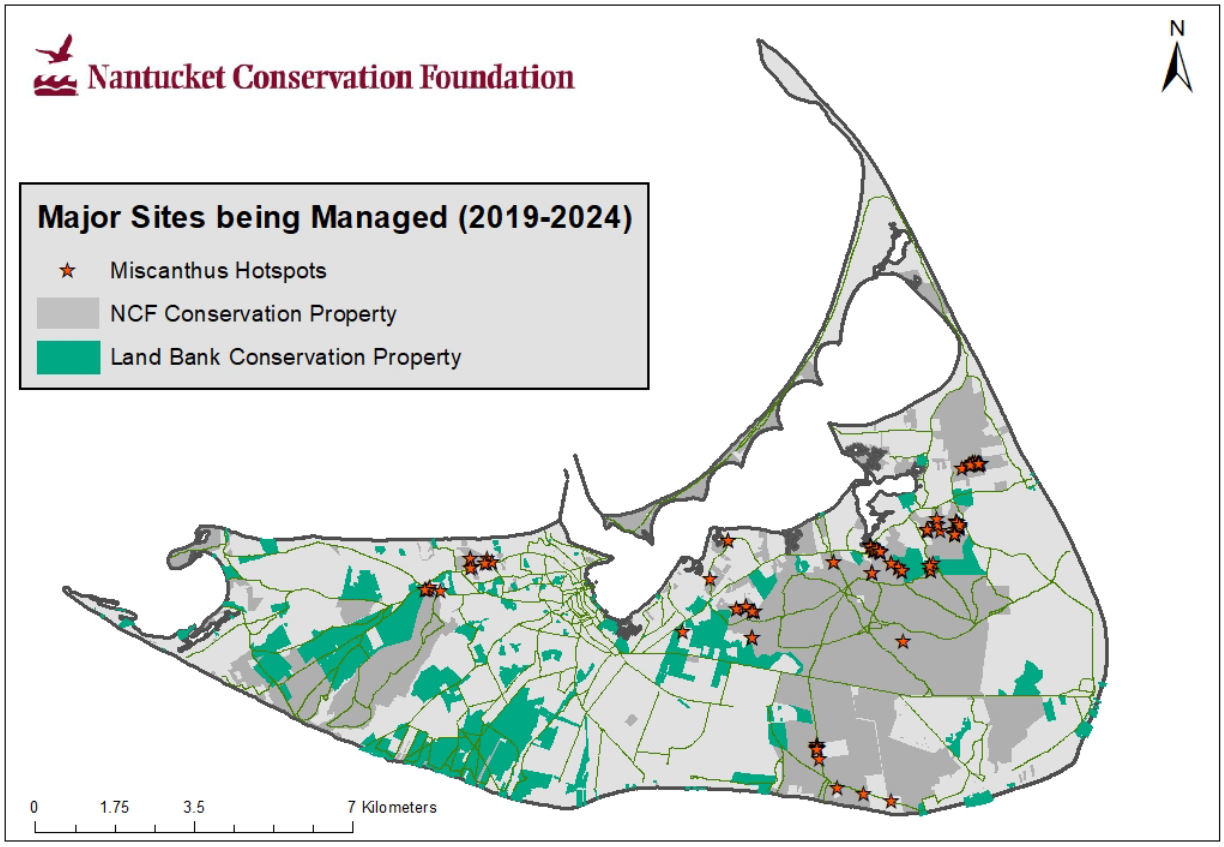

Figure 3. Locations of major *Miscanthus sinensis* populations (red stars) found and targeted for management on Nantucket Conservation Foundation and some adjacent partner conservation lands (gray areas on map are NCF and green areas are Nantucket Islands Land Bank properties) (2019-2024).

Figure 4. January 2025 documentation of high-density area of *M. sinensis* on Nantucket Island, MA. The population occurs in minimally managed habitat at Nanahumacke Preserve. We estimate that there is about 75% dense coverage of that area, along with scattered patches and single plants in the northern half of the field. The total area of dense *M. sinensis* is approximately 0.71 acres, and there are many smaller patches and single plants spreading in the rest of this field that are not individually represented on this map.

Figure 5. Photos of dense stands of *M. sinensis* at Nanahumacke Preserve, Nantucket, MA, January of 2025, photos: Sarah Bois.

Figure 6. Photos of dense stands of *M. sinensis* from Nanahumacke Preserve, Nantucket, MA in January of 2025, photos: Sarah Bois.

Figure 7. Photos of dense stands of *M. sinensis* in open habitat at Heckscher State Park, Long Island, New York, photo: Julie Lundgren.

Figure 8. Photos of *M. sinensis* in understory habitat at Heckscher State Park, Long Island, New York, photo: Julie Lundgren.

Figure 9: Photo of *Miscanthus sinensis* in minimally managed habitat, Nantucket, MA; plant growing in a sand road edge at Head of the Plains conservation property, photo: Kelly Omand.

Figure 10. Photos of *Miscanthus sinensis* in minimally managed habitats of brush cut fire breaks, Nantucket, MA, photos: Sarah Bois.

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Information compiled by:

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Sarah T. Bois, Linda Loring Nature Foundation, 3/20/2025

SPECIES: Rhodotypos scandens (Thunb.) Makino

STATUS: Likely Invasive

NON-NATIVE INVASIVE PLANT WORKSHEET

MASSACHUSETTS CRITERIA FOR EVALUATING NON-NATIVE PLANT SPECIES FOR INVASIVENESS

The Massachusetts Invasive Plant Advisory Group (MIPAG) defines invasive plants as "*non-native species that have spread into native or minimally managed plant systems in Massachusetts. These plants cause economic or environmental harm by developing self-sustaining populations and becoming dominant and/or disruptive to those systems.*" As defined here, "species" includes all synonyms, subspecies, varieties, forms, and cultivars of that species, unless proven otherwise by a process of scientific evaluation.

The following criteria are being used to objectively evaluate and categorize plant species suspected of being, or with the potential to become, invasive in Massachusetts. They were originally developed in 2005 by the George Safford Torrey Herbarium at the University of Connecticut and a subcommittee of the Massachusetts Invasive Plant Group representing science, nursery, and conservation professionals. They were updated by MIPAG in 2022 to include climate change considerations and other minor clarifications.

The criteria enable the separation of plants into the following categories:

- *Invasive Plants* in Massachusetts
- *Likely Invasive Plants* in Massachusetts
- *Potentially Invasive Plants* in Massachusetts (species not currently known to be naturalized in Massachusetts, but that can be expected to become invasive within minimally managed habitats within the Commonwealth)

For a species to be included on the list of species determined to be **Invasive, Likely Invasive or Potentially Invasive** in Massachusetts, it must be substantiated by scientific investigation (including herbarium specimens, peer-reviewed papers, published records and other data available for public review) to meet specific criteria. The process of reviewing individual plant species for their invasiveness in Massachusetts is ongoing and may result in a change in status pending new data and further review.

Tabular summary of criteria to be met

	Criteria that must be met
Base criteria	1-4
Invasive	1-9
Likely Invasive	1-5, at least one of 6-9, at least one of 10-12
Potentially Invasive	1-4 (not 5), 13-15

For a species to be designated as "INVASIVE," "LIKELY INVASIVE" or "POTENTIALLY INVASIVE" it must meet certain base criteria (#1-4 below). The species must:

1. Be nonindigenous to Massachusetts.

Yes *No*

Jetbead is native to Manchuria, North-Central China, and Southeast China, as well as Japan and Korea (North Carolina Extension Gardener Plant Toolbox, n.d.).

2. Have the biologic potential for rapid dispersion and establishment in minimally managed habitats

Yes *No*

Regarding sexual reproduction, Jetbead is monoecious, minimizing reliance on animal pollination in favor of wind-driven pollination (The National Gardening Association, n.d.). Its berries are also attractive to birds (Rudolf & Owston, n.d.), especially in winter when other food sources are scarce (Plant Finder, n.d.). Jetbead can also spread asexually via adventitious roots grown from stems in contact with the soil, and has a mounding habit that can allow it to obstruct neighboring vegetation and form dense stands (Invasive.Org, n.d.).

3. Have the biologic potential for dispersing over spatial gaps away from the site of introduction.

Yes *No*

Bird dispersal is the primary vector of spread for Jetbead in the U.S., as indicated by the sparse yet widespread distribution of observations across the eastern half of the country (iNaturalist, n.d.). Its seeds may also be transported downstream or along coasts should the originating Jetbead plant be grown near a body of water, which is possible given its tolerance of a wide range of soil conditions (Plant Finder, n.d.; Invasive.Org, n.d.).

4. Have the biologic potential for existing in high numbers away from intensively managed artificial habitats

Yes *No*

Nonnative to the U.S., there are essentially no organisms that consume its stems or foliage, and no known disease problems (North Carolina Extension Gardener Plant Toolbox, n.d.). One plant can produce about 100 seeds per season (Clemants & Moore, 2008) which germinate one or two years later, following cold stratification (Rudolf & Owston, n.d.). Asexual layering can also obstruct competing vegetation and enable further spread in a localized area (Invasive Plant Atlas of the United States, n.d.).

If a species does not meet all four of the previous criteria, stop here. The species cannot be listed at this time. If a species meets all four, go on to #5.

5. The species is naturalized in Massachusetts (persists without cultivation in Massachusetts)

Yes *No*

Of the 196 total Jetbead observations in MA, 190 are classified as "research grade," their dates ranging from 2015 to 2023. The majority of these observations record Jetbead growing in natural, typically forested environments, or on the border of these areas, as do observations from other states (iNaturalist, n.d.).

If a species meets Criteria 1-4 and Criterion 5, it may be considered "INVASIVE" or "LIKELY INVASIVE" in Massachusetts. Go to Criteria 6-9.

If it does not meet Criteria 5, it may be considered "POTENTIALLY INVASIVE" if it meets Criteria 13-15.

6. The species is widespread in Massachusetts, or common in a region or habitat type(s) in the state.

Yes *No*

Jetbead has been identified growing in natural areas in 12 of Massachusetts' 14 counties, and as such is widespread throughout the state. It is, however, more commonly observed in some counties than others. Middlesex County has the largest sum of observations by far, with 110 observations classified as research grade, more than four times as many as the county with the second largest sum, being Norfolk County (iNaturalist, n.d.). This may be a reflection of the county's relatively high population density, however, and not necessarily reflect Jetbead's full extent. Still, these observations illustrate that the species has reached almost all areas of the state.

7. The species has many occurrences in MA that have high numbers of individuals in minimally managed habitats.

Yes ***No***

The number of recorded observations of Jetbead are relatively low, especially in Massachusetts. With just 190 research grade observations logged in iNaturalist, and 5 in EDDMapS, it remains relatively rare to see in natural environments compared to other invasive plant species. It is rare even in the U.S. overall, as while there are currently 5,483 total Jetbead observations in the U.S. listed on iNaturalist, there are 29,820 observations listed for Berberis thunbergii (Japanese Barberry), for comparison (EDDMapS, n.d.; iNaturalist, n.d.).

8. The species is able to out-compete other species in the same natural plant community.

Yes *No*

Asexual layering and a lack of predation mean Jetbead can grow more rapidly and in denser stands than native plant species. This is especially true in forest understories, where this shade tolerant shrub has the potential to crowd out native perennials and tree seedlings (Essl, 2019) via these dense mounds (Plant Finder, n.d.). Since it may also be of value to wildlife as cover in this way (USDA Plants Database, n.d.), wildlife species might be disinclined to demolish or consume Jetbead stands. Indeed, Erik Sechler, Ecological Programs Coordinator at Native Plant Trust, has observed Jetbead dominating a forest understory in a shale-barren habitat in south central PA in 2015 (E. Sechler, personal communication, 2024). This provides evidence indicating Jetbead's capacity to out-compete other species in natural plant communities, even if it requires a slightly warmer climate and enough growing time to do so.

9. The species has the potential for rapid growth, high seed or propagule production and dissemination, and establishment in natural plant communities.

Yes *No*

While each drupelet only produced one seed, each Jetbead plant may grow hundreds of drupelets with seeds that remain viable for multiple years (Clemants & Moore, 2008). Moreover, Jetbead is commonly advertised in the horticultural trade for its aggressive, rapid growth (Quackin Grass Nursery, n.d.), and if left unmanaged, it will grow wider than it is tall, re-rooting in the process and propagating further (North Carolina Extension Gardener Plant Toolbox, n.d.).

If a species meets the initial five Criteria and Criteria 6-9 it may be considered an "INVASIVE" species in Massachusetts.

If a species meets the initial five Criteria, but does not meet all of Criteria 6-9 at this time, it may be considered a "LIKELY INVASIVE" species in Massachusetts if in addition it meets at least one of the following three Criteria (#10-12).

10. The species has at least one occurrence in Massachusetts that has high numbers of individuals forming dense stands in minimally managed habitats.

Yes ***No***

In Massachusetts, essentially all of the observed Jetbead individuals are fairly young and have yet to form the somewhat denser, taller stands observed in more southern states. Naturalized stands of Jetbead in MA tend to consist of only a handful of individuals at most, and are relatively isolated, indicative of bird dispersal (iNaturalist, n.d.)

11. The species has the potential, based on its biology, colonization history outside its native range, and likelihood of range expansion or change in biologic potential from climate change predictions, to become invasive in Massachusetts.

Yes *No*

Currently, MA represents the northernmost point Jetbead has currently reached in the U.S., although the warming of the state's climate may make this area more hospitable to Jetbead's spread in the future, given its current extent in relatively southern states. For example, Jetbead is considered by some as one of many "common early spring plants" in Pennsylvania (Chester Creek Trail, n.d.). It can tolerate cold weather up to USDA Hardiness Zone 4 (Oregon State University, n.d.), a climate range that already encompasses all of MA as of 2023 (USDA Plant Hardiness Zone Map, n.d.). Lacking predators and tolerant of a wide range of soil, light, and water conditions, its current range in MA may be the first stage of its further expansion across the state.

12. The species is acknowledged to be invasive in nearby states, but its status in Massachusetts is unknown or unclear. This may result from lack of field experience with the species or from difficulty in species determination or taxonomy.

Yes *No*

According to Invasive.Org (n.d.), Jetbead has been reported as invasive in DE, IL, MA, MI, NY, PA, VA, and WI. While it has not been considered invasive in MA in any official capacity, the species is certainly more prevalent in states southwest of Massachusetts. Specifically, Jetbead has been evaluated for its invasiveness by states including New York and Indiana, receiving moderate rankings (Clemants & Moore, 2008; Schuck, 2019). Several other states do list Jetbead on their invasive species lists as well, according to a map produced by EDDMapS (n.d.).

If the species meets the basic criteria for invasiveness (Criteria 1-4) but is not naturalized in Massachusetts (Criterion 5), the species may be considered "POTENTIALLY INVASIVE" in Massachusetts if it meets the following three criteria (#13-15):

13. The species, if it becomes naturalized in Massachusetts, based on its biology and biologic potential, would pose an imminent threat to the biodiversity of Massachusetts **and**

Yes No

14. Its naturalization in Massachusetts is anticipated, **and**

Yes No

15. The species has a documented history of invasiveness in other areas outside its native range including expansion of range and/or change in biological potential from climate change predictions.

Yes No

Completed by: Edward Ferguson Cucchi, Native Plant Trust & Framingham State University, 5/10/24

Decision by MIPAG and date: Likely Invasive, December 12, 2024

DEFINITIONS* TO ACCOMPANY
"CRITERIA FOR EVALUATING NON-NATIVE PLANT SPECIES FOR INVASIVENESS IN MASSACHUSETTS"

Biologic potential - The ability of a species to increase its number, either sexually and/or asexually.

Invasive plants - Non-native species that have spread into native or minimally managed plant systems in Massachusetts. These plants cause economic or environmental harm by developing self-sustaining populations and becoming dominant and/or disruptive to those systems. *As defined here, "species" includes all synonyms, subspecies, varieties, forms, and cultivars of that species unless proven otherwise by a process of scientific evaluation.*

Indigenous species - A species that occurs natively in Massachusetts. Indigenous species often have a pre-colonial presence (pre-1500) or have arrived in the region more recently without the aid of human intervention. Synonymous with native species.

Intensively managed habitats - Intensively managed habitats are habitats or land systems where management efforts and investments of time, money and labor occur frequently. Examples include manicured lawns, landscaped grounds, gardens, roadsides or agricultural lands for crops or livestock.

Likely Invasive plants - Non-native species that are naturalized in Massachusetts and meets some but not all criteria that would trigger an "Invasive plant" designation.

Minimally managed habitats - Minimally managed habitats are habitats where management efforts and investments of time, money and labor are infrequent or non-existent. These habitats may have been intensively managed for anthropogenic reasons at one time in their history. In some instances, management may be more intense, but management is done for conservation purposes and is primarily aimed at preserving elements of biological diversity such as imperiled species or critical natural communities. Minimally managed habitats are similar to "natural areas" but the distinction is made in order to remove bias, misconceptions or ambiguities that surround the term "natural area".

Non-indigenous species - A species that is not native or naturally occurring (based on its biology, phylogeny, distribution and current knowledge about the species) within Massachusetts. A species may be indigenous to North American but non-indigenous in Massachusetts. Synonymous with non-native species.

Naturalized species - A non-indigenous taxon that occurs without the aid and benefits of cultivation in Massachusetts. Further, it implies two biological points: it freely and regularly reproduces in the wild, sexually or asexually, and occurrences persist over time.

Natural plant community - A natural plant community is an association or assemblage of plant species that repeatedly occur together in re-occurring patterns in a specific type of habitat. This assemblage can be characterized by dominant species and biological properties. A natural plant community implies a minimally managed situation where all or most of the species that make up the assemblage are indigenous to the defined area.

Occurrence - Existing example of a species on the landscape.

Potentially invasive plants - Non-native species not currently known to be naturalized in Massachusetts, but that can be expected to become invasive within minimally managed habitats within the Commonwealth.

Spatial gaps - This term is used in reference to the ability of a species to disperse away from existing occurrences. The concept of crossing spatial gaps is used to distinguish those species that can disperse over discontinuities and become established elsewhere, from species that spread across a habitat only by continual, uninterrupted growth.

**There are no definitions for certain terms (e.g. widespread or high numbers) with the intent that discussion within MIPAG will be used to determine the outcome, given that we do not have perfect information.*

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Species Information

***Rhodotypos scandens* (Thunb.) Makino**
Syn. *Rhodotypos tetrapetalus* (Siebold) Makino

TAXONOMY

Kingdom:	**Plantae**
Subkingdom:	**Tracheobionta**
Superdivision:	**Spermatophyta**
Phylum:	**Magnoliophyta or Anthophyta**
Class:	**Magnoliopsida or Dicotyledoneae**
Subclass:	**Rosidae**
Order:	**Rosales**
Family:	**Rosaceae**
Genus species:	***Rhodotypos scandens* (Thunb.) Makino - "Jetbead"**
Synonym:	***Rhodotypos tetrapetalus* (Siebold) Makino**

Taxonomy credit: *USDA Plants Database*, n.d. Alternative phylum and class listing found at *NatureServe Explorer*, n.d. Depreciated species names, as well as common names, found at *North Carolina Extension Gardener Plant Toolbox*, n.d. and *Kew Science*, n.d.

Summary*: Rhodotypos scandens*, also known as White Kerria, Jetberry Bush, Black Jetbead, or simply Jetbead, is a perennial, deciduous shrub that can grow to heights between 1-3 meters. It is composed of multiple woody stems that produce two opposite stalked simple leaves per node, which have distinct serrated margins. Jetbead flowers between April and May, producing showy white flowers with 4 petals. Its fruits, which grow in clusters of 1-4, form between June and September, initially appearing red before maturing into shiny, black, and bead-like drupes. The fruits are smooth with no wings or spines, and the stems have smooth bark with no armature. This shrub also has no known cultivars or varieties. (*Invasive Plant Atlas of the United States*, n.d.; *Go Botany*, n.d.; *North Carolina Extension Gardener Plant Toolbox*, n.d.; *Efloras.Org*, n.d.)

Native Region or Range: Broadly, Jetbead's native range extends across temperate regions of East Asia, where it grows on mountain slopes or in valleys between elevations of 100-800 meters. It is specifically native to Manchuria, North-Central China, and Southeast China, as well as Japan and Korea. (*Invasive Plant Atlas of the United States*, n.d.; *North Carolina Extension Gardener Plant Toolbox*, n.d.; *Efloras.Org*, n.d.)

Figure 1: *Rhodotypos scandens* native range. (*Kew Science*, n.d.)

Figure 2: *Rhodotypos scandens* "full form." Photo by Jim Robbins. (*North Carolina Extension Gardener Plant Toolbox*, n.d.)

Figure 3: *Rhodotypos scandens* "flower (A), cluster of four shiny black drupelets from the preceding year (B)…24th April 2019. Photos by F. Essl." (Essl, 2019)

HISTORY

Essl (2019) reports Jetbead's presence in unmanaged forested areas of several European countries, including Austria, Hungary, Germany, and Belgium, and The North Carolina Extension Gardener Plant Toolbox (n.d.) reports that Jetbead has been introduced to Uzbekistan. The Austrian population now consists of a few thousand individual plants, some of which had escaped cultivation and invaded deciduous forest fragments that remained among heavily used agricultural fields. The species was first recorded in Belgium in 1947. By comparison, relatively few records of Jetbead's presence exist for Western Europe, and it has yet to be reported in the British Isles (Essl, 2019). Additionally, Jetbead was first introduced to the United States in 1866 via the horticultural trade as an ornamental plant (*Invasive Plant Atlas of the United States*, n.d.). It has since been recorded in the following 26 U.S. states: AL, CT, DE, DC, GA, IL, IN, KS, KY, MA, MI, MS, MO, NE, NH, NJ, NY, NC, OH, PA, SC, TN, VT, VA, WV, and WI (*North Carolina Extension Gardener Plant Toolbox*, n.d.).

BIOLOGY

Life Form – Jetbead is considered a small deciduous woody shrub (*Go Botany*, n.d.) with a "mounding" habit, naturally growing wider than it does tall (*Plant Finder*, n.d.). Its leaves are 40–110 millimeters long and 30–60 millimeters wide (*Go Botany*, n.d.).

Naturalized – Jetbead has been recorded as present in unmanaged, non-anthropogenic settings outside its native range, both in academic literature (Essl, 2019) and in citizen science databases such as EDDMaps and iNaturalist. 753 instances of Jetbead growing within the U.S. have been reported on EDDMaps, and of these, 5 are located within MA. On iNaturalist, the majority of Jetbead observations are recorded in the U.S., though some instances have been recorded in Europe as well. Of the 196 total Jetbead observations in MA, 190 are classified as "research grade," their dates ranging from 2015 to 2023 (below).

County	Total Observations	Research Grade Observations
Barnstable County	1	**1**
Berkshire County	2	**2**
Bristol County	1	**1**
Dukes County	0	**0**
Essex County	8	**8**
Franklin County	1	**0**
Hampden County	2	**2**
Hampshire County	3	**2**
Middlesex County	114	**110**
Nantucket County	0	**0**
Norfolk County	25	**25**
Plymouth County	4	**4**
Suffolk County	18	**18**
Worcester County	17	**17**

Many of the images associated with these iNaturalist observations display Jetbead growing in natural habitats. Finally, a total of 49 unique records of Jetbead have been collected and listed by the Consortium of Northeastern Herbaria, Harvard University Herbaria Digital Collections, and University of Connecticut Herbarium. While some of the source Jetbead plants were located on college campuses or in personal gardens, others were collected from trails, roadsides, or other natural areas where they were likely not intentionally planted.

Dispersal – Jetbead can spread both by seed and vegetatively (*Invasive.Org*, n.d.), the latter occurring via natural layering, wherein a branch produces adventitious roots upon growing long enough to touch the soil. Rudolf & Owston (n.d.) speculate that this species may provide value to wildlife as cover and a food source, particularly to birds which may feed on its berries and carry seeds long distances. Its berries persist into the winter (*Plant Finder*, n.d.), increasing this likelihood.

Massachusetts habitats – While Jetbead grows best in full sun, it can also tolerate the full shade of a forest understory. It can adapt to poor soils, a wide range of soil pH levels, compacted soils, drought, urban pollution or high salt concentrations (*Invasive.Org*, n.d.) and clay soils (*Plant Finder*, n.d.). It also has no notable insect or disease problems and can tolerate cold climates (*North Carolina Extension Gardener Plant Toolbox*, n.d.), being hardy up to USDA Zone 4 (*Oregon State University*, n.d.), a climate range that encompasses all of MA as of 2023 (*USDA Plant Hardiness Zone Map*, n.d.). However, it does prefer moderately wet, well-drained soils (*Plant Finder*, n.d.). Overall, these traits make it very likely to successfully grow even in undisturbed MA forest settings, though especially in disturbed forest borders or along shallow waterways throughout the state.

Biological potential – As mentioned, the fruits produced by Jetbead attract wildlife—especially birds—well into the winter when food is scarce, increasing the chance of their seeds being transported large distances. And while their fruits are drupelets and only contain a single seed each, potentially limiting their spread, one Jetbead bush may produce 100 seeds in a season (Clemants & Moore, 2008) which can germinate up to 2 years later (Rudolf & Owston, n.d.). Also related to their sexual reproduction is that Jetbead is monoecious, forming both female and male reproductive organs on each plant (*The National Gardening Association*, n.d.). This minimizes the need for pollinators to travel from male to female plants in favor of wind pollination, which may be more broadly available in non-native areas lacking co-evolved pollinators. Jetbead also spreads locally via asexual means, such as layering, meaning it is more capable of forming dense monocultural stands in the shaded understories of forests. With the wide range of conditions it can tolerate, described earlier, Jetbead may then displace native forest floor species and restrict the germination of tree seedlings (*Invasive Plant Atlas of the United States*, n.d.).

REPORTED INVASIVENESS

DISTRIBUTION

Massachusetts Counties

BE	FR	HS	HD	WO	MI	ES	SU	NO	BR	PL	BA	DU	NA
X	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**		

References: EDDMapS, iNaturalist, and the three herbaria mentioned earlier. While some counties had only one or two associated iNaturalist observations (above), these were all verified either by the attached photos, which clearly display Jetbead's distinct berries (as was the case for the counties of Bristol (ID: 173049454), Hampden (ID: 94370383), and Hampshire (ID: 18008929)), or with the help of identifications from MA state botanist Karro Frost (for the counties of Franklin (ID: 143238196) and Barnstable (ID: 25193312)).

SPREAD & IMPACTS

While Jetbead has spread to inhabit 26 states primarily in the eastern half of the U.S., at this time, it remains a relatively rare plant to encounter in the wild, especially in Massachusetts. Below is a map depicting the states where a Jetbead plant has been observed and logged using EDDMapS.

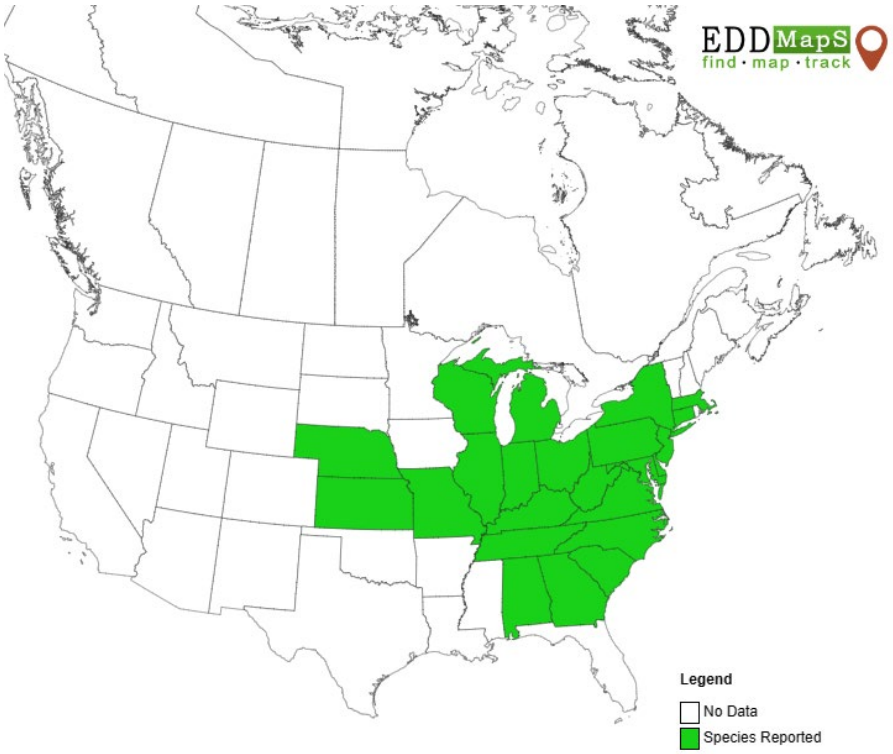


Figure 4: Introduced range of *Rhodotypos scandens* in U.S. by state (*EDDMapS*, n.d.).

Below is another map from EDDMapS, this time displaying Jetbead observation density by county, which more accurately represents the species' rarity. Most observations are centered around New York City, extending westward, a trend corroborated by the observation map produced by iNaturalist contributions. MA essentially represents the northernmost point Jetbead has currently reached, although the warming of the state's climate may make this area more hospitable to Jetbead's spread in the future, given its current extent in relatively southern states. For example, Jetbead is considered by some as one of many "common early spring plants" in Pennsylvania (*Chester Creek Trail*, n.d.).

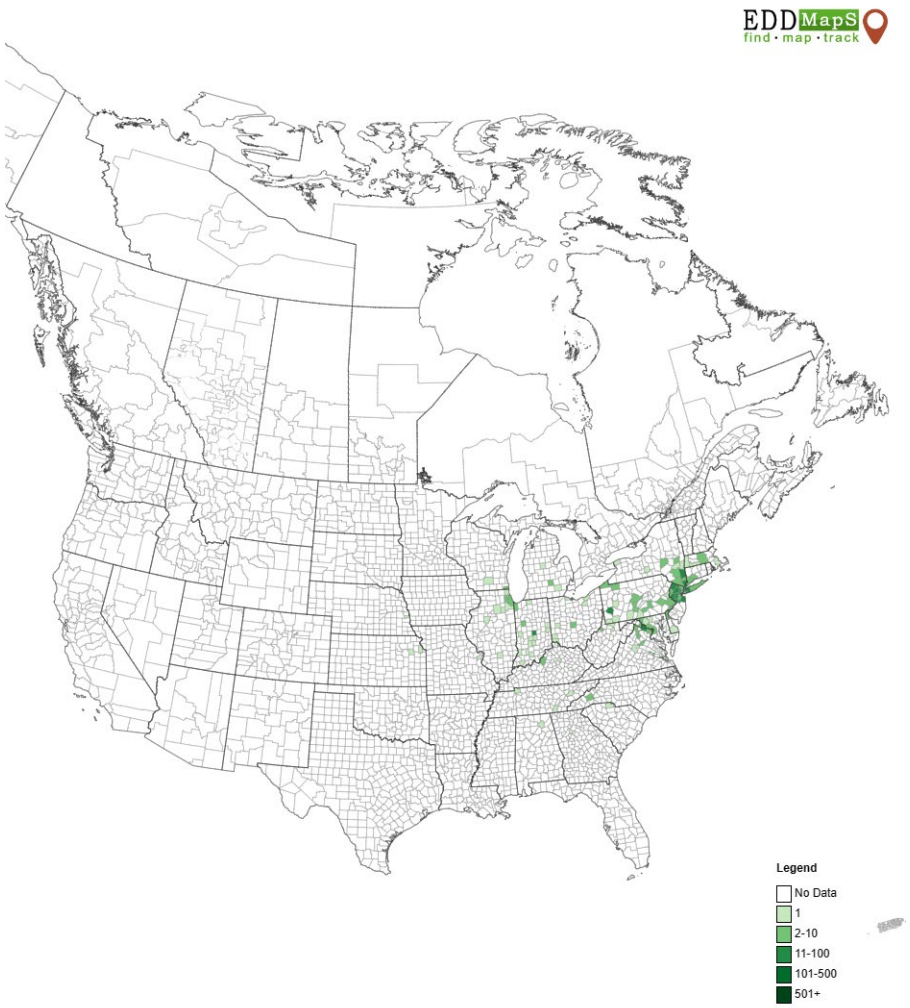
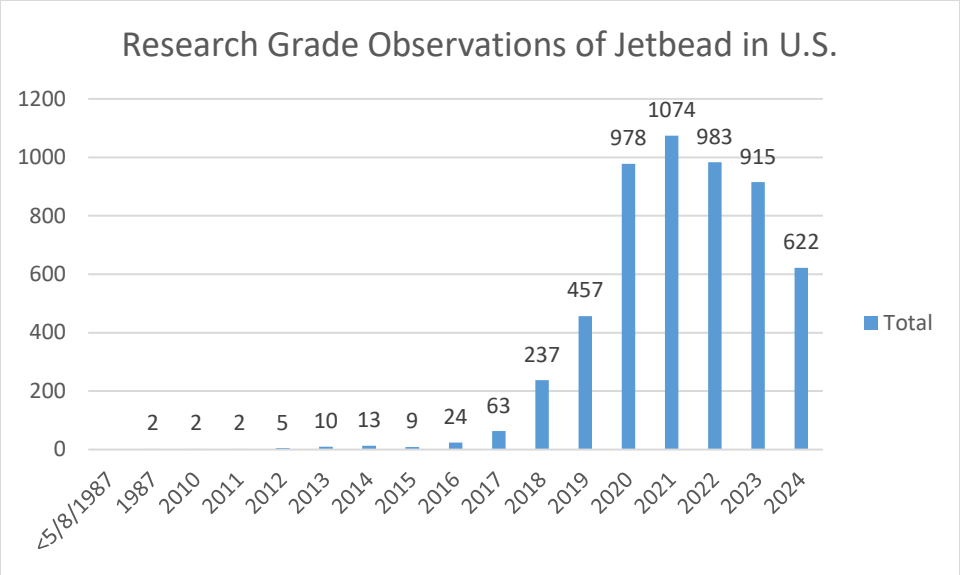
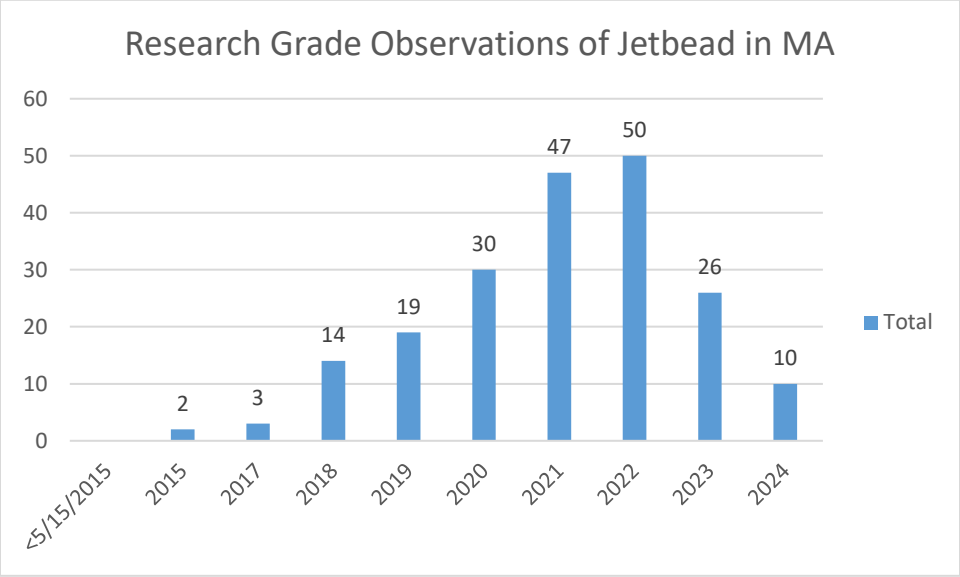


Figure 5: Introduced range of *Rhodotypos scandens* in U.S. by county (*EDDMapS*, n.d.).

There are currently 5,483 total Jetbead observations in the U.S. listed on iNaturalist (*iNaturalist*, n.d.). For comparison, *Berberis thunbergii* (common name Japanese Barberry), a fairly similar invasive shrub species, currently has 29,820 observations. Whether this is a symptom of Japanese Barberry simply being more well-known, or of Jetbead's rarity, is not entirely clear, but it is at least true that the number of observations of Jetbead is increasing, potentially indicating its spread. The following are two graphs illustrating this increase in observations, both across the U.S. and in MA specifically, using the dates of "research grade" observations from iNaturalist. Interestingly, observation totals in recent years have fallen somewhat, though this may be a symptom of the sudden rise and slight decline in the popularity of citizen science applications, like iNaturalist, seen as the result of the COVID-19 pandemic.



Graph 1: Yearly counts of iNaturalist "research grade" observations of Jetbead in the U.S., using data downloaded from iNaturalist (n.d.). Note that 2024 has not yet concluded, so the full year is not yet represented.



Graph 2: Yearly counts of iNaturalist "research grade" observations of Jetbead in just MA, using data downloaded from iNaturalist (n.d.). Note that 2024 has not yet concluded, so the full year is not yet represented.

On a smaller scale, much of the spread of Jetbead around New York City appears to follow the contours of coastal areas, and some observations are located along the length of Long Island. This represents another vector of Jetbead invasion besides dispersal by birds, that being along the coast of Long Island to southeastern Massachusetts. As mentioned, Jetbead is tolerant of poor soils and favors good drainage, so it may thrive in these relatively sandy coastal areas. Its seeds may also be carried downriver or on ocean currents.

That said, at this moment, southern Jetbead stands appear generally more well-established than northern ones located in Massachusetts, though the existence of isolated plants in unmanaged MA forests may indicate that long-range seed dispersal by birds has already begun to spread the species to MA. For example, compare the following observations of a Jetbead stand in Pennsylvania (left, ID: 208564609) to one in Massachusetts (right, ID: 116839650). The PA stand appears slightly older and more expansive than the MA one.

Figure 6: PA and MA Jetbead observations (*iNaturalist*, n.d.).

Despite the threat posed to U.S. ecosystems by Jetbead's invasive potential, its seeds remain up for sale on numerous online storefronts, advertised for the species' hardiness, tolerance of many harsh conditions, aggressive growth, and attractive berries. Some even encourage mass-plantings of the bush (*Quackin Grass Nursery*, n.d.; *Plant World Seeds*, n.d.; sheffields.com, n.d.).

Moreover, Jetbead is not yet included in any Massachusetts law regarding invasive plant species (*Mass.Gov*, 2023). And while it is listed in the invasive species legislation of one state, Maryland, it has yet to be assessed for addition to this list (*Maryland Invasive Plants Prevention and Control*, n.d.). However, it is included on several states' invasive plant species lists, with no associated legal restrictions. This information is depicted on the map below. Additionally, the species has been evaluated for its invasiveness by states including New York and Indiana, receiving moderate rankings (Clemants & Moore, 2008; Schuck, 2019).

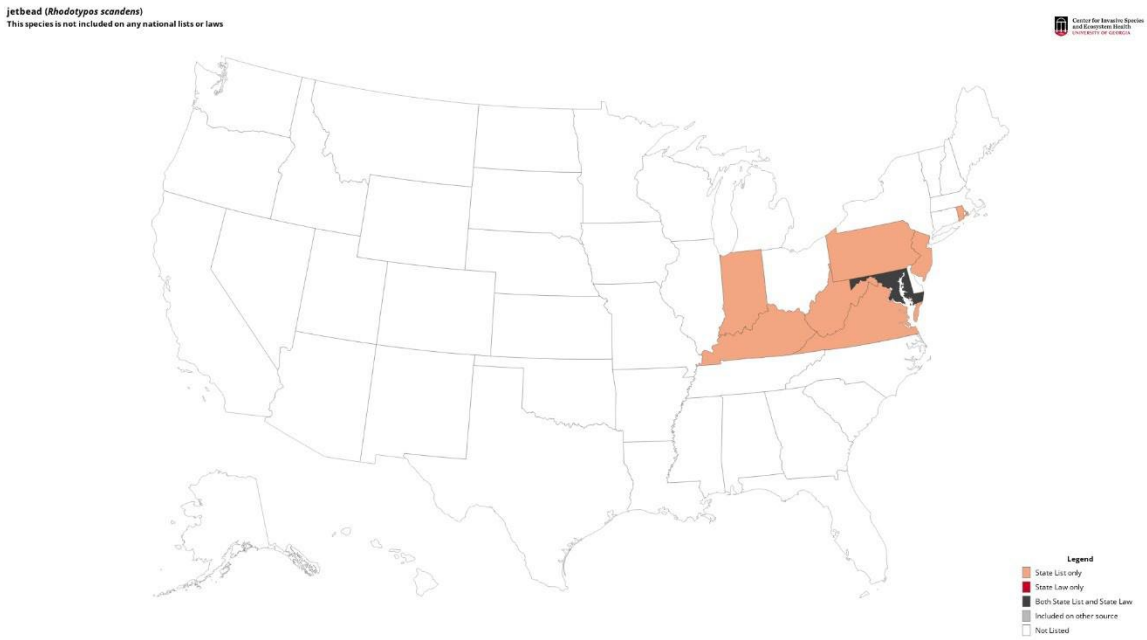


Figure 7: "This map identifies those states that have this species on their invasive species list or law" (*EDDMapS*, n.d.).

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