

Ohio Invasive Plant Assessment Protocol

Botanical Name: *Miscanthus sinensis*
 Common Name: Chinese Silvergrass, Eulaliagrass Step I Outcome: **Continue**
 Family Name: Poaceae Step II Score: **49**
 Posted Date: 7/20/16 Step II Outcome: **Invasive**
 Assessment conducted by: lyn Morgan and Theresa C

Score **Notes** **References**

Step I

Directions: Place an "X" in the Score column next to the selected answer to each of the four questions.

<p>1. Is this plant known to occur in the state and listed as "noxious" on any federal or Ohio Department of Agriculture plant list?</p>	<p>Yes. Place on invasive plant list, no further investigation needed. STOP</p> <p>No. Continue on to question 2.</p>	<div style="background-color: #a6c9ec; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">X</div>		1
<p>2. Has this plant demonstrated widespread dispersion and establishment (i.e. high numbers of individuals forming dense stands) in natural areas across two or more regions in Ohio?^a</p>	<p>Yes. Place on invasive plant list, no further investigation needed. STOP</p> <p>No. Continue on to question 3.</p>	<div style="background-color: #a6c9ec; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">X</div>		2
<p>3. Does this plant form self-replicating populations outside of cultivation in Ohio and is it documented to alter the composition, structure, or normal processes or functions of a natural ecosystem?</p>	<p>Yes</p> <p>No</p> <p>Unknown</p>	<div style="background-color: #a6c9ec; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">X</div>	<p>It does form self-replicating popn in OH but its ability to affect the ecosystem in OH is still under study.</p>	3, 4
<p>4. Is the plant listed as invasive in an adjoining state or a nearby state east of the Mississippi within the USDA Plant Hardiness zones 5-6?^{b,c}</p>	<p>Yes</p> <p>No</p> <p>Unknown</p>	<div style="background-color: #a6c9ec; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">X</div>	<p>Illinois, Indiana (Medium), PA, NY (Regulated), Connecticut</p>	20

If the answer was yes for both questions 3 and 4, the plant is placed on the invasive plant list and no further research is needed. Stop here. If the answer is no for both questions 3 and 4, the plant is not considered invasive and no further investigation is warranted. Otherwise, proceed to Step II.

Step II: Invasion Status

Directions: Place the appropriate numerical score (or "U") in the Score column next to the selected answer to each of these 18 questions.

<p>1. Current Invasion in Ohio</p> <ul style="list-style-type: none"> - plant is not found in natural areas (0 pts.) - plant is found in natural areas but only because it persist from previous planting in that location (e.g. old home sites) (0 pts.) - plant is only expanding from sites of previous planting (1 pt.) - plant occurs in natural areas away from site of planting (3 pts.) - Information unknown (U) 		<div style="background-color: #f4a460; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">3</div>	<p>20: The species can easily spread away from sites of planting in the eastern US while observations west of the Appalachian region appear to not be escapes, but ornamental plantings in current or abandoned gardens.</p>	4,20
<p>2. State Distribution^a</p> <ul style="list-style-type: none"> - plant is not naturalized in any region of Ohio (0 pts.) - plant is naturalized in only one region in Ohio (1 pt.) - plant is naturalized in two regions in Ohio (2 pts.) - plant is naturalized in three regions in Ohio (3 pts.) - plant is naturalized in four regions in Ohio (4 pts.) - plant is naturalized in five regions in Ohio (5 pts.) - Information unknown (U) 		<div style="background-color: #f4a460; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">5</div>	<p>All regions</p>	2
<p>3. Regional/US Distribution</p> <ul style="list-style-type: none"> - plant is not considered to be a problem in any other state (0 pts.) - plant has been reported as a widespread problem in another non-neighboring state within the USDA Plant Hardiness Zones 5-6 (1 pt.) - plant has been reported to be a widespread problem in 1-2 adjoining states (3 pts.) - plant has been reported to be a widespread problem in 3 or more adjoining states (5 pts.) 		<div style="background-color: #f4a460; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">3</div>	<p>In NY, Conn, also seen in KY; Not on lists in IN, WI, MN, MI, PA, MA</p>	2,23,24

Ohio Invasive Plant Assessment Protocol

Botanical Name: *Miscanthus sinensis*
 Common Name: Chinese Silvergrass, Eulaliagrass Step I Outcome: **Continue**
 Family Name: Poaceae Step II Score: **49**
 Posted Date: 7/20/16 Step II Outcome: **Invasive**
 Assessment conducted by: lyn Morgan and Theresa C

	Score	Notes	References
<ul style="list-style-type: none"> - plant has been reported to be a widespread problem in similar habitat outside the US (1 pt.) - Information unknown (U) 			
Step II: Biological Characters			
4. Vegetative Reproduction			
<ul style="list-style-type: none"> - no vegetative reproduction (0 pts.) - reproduces readily within the original site (1 pt.) - has runners or spreading rhizomes that root easily (3 pts.) - fragments easily and fragments can be easily dispersed (4 pts.) - has runners or spreading rhizomes that root easily AND fragments easily and fragments can be easily dispersed (5 pts.) - Information unknown (U) 	3	1: "Chinese silvergrass regenerates by sprouting from the rhizomes and by tillering. Rhizomes may aid the recovery of Chinese silvergrass if it is top-killed". 20: Species can disperse through fragmentation and movement of rhizomes	1,20
5. Sexual Reproduction			
<ul style="list-style-type: none"> - no sexual reproduction (0 pts.) - infrequent sexual reproduction (1 pt.) - frequent sexual reproduction, but high variation among years in seed production (3 pts.) - frequent sexual reproduction (one or more events per year) (5 pts.) - Information unknown (U) 	3	9: Species is self-incompatible and produces seeds. 8: Seeds are 52-63% viable. 19: Populations in the US are genetically admixed, suggesting sexual reproduction. 20: Produces viable seed. 22: cultivars produce seed of varying amounts over 5 yrs in IL (zone 5).	8,9,19,20,22
6. Number of Viable Seeds or Propagules per Plant			
<ul style="list-style-type: none"> - few (0-10) (1 pt.) - moderate (11-1,000) (3 pts.) - prolific (>1,000) (5 pts.) - Information unknown (U) 	5	20: Ohio population: germination of 0-51% and an average of 22.4%. 1: 64-1051; 8: 52-63% seed germination. 10: all seed collected across the latitudinal range in the US was viable; a fully mature plant can produce >100 flowering panicles per year with approx. 1,800 spikelets per panicle. 11: Germination rates of seeds collected in Japan range from 10-nearly 100%. 13: Seed output per plant ranged from 0 to >250,000 seeds.	1,8,10,11,13,18,20
7. Flowering Period			
<ul style="list-style-type: none"> - one month or less per year (0 pts.) - two months (1 pt.) - three to five months (2 pts.) - longer than five months (3 pts.) - Information unknown (U) 	2	5: "Late July until Frost"	5
8. Dispersal Ability			
<ul style="list-style-type: none"> - low potential for long-distance seed/propagule dispersal (>1km) (0 pts.) - medium potential for long-distance seed/propagule dispersal (3 pts.) - high potential for long-distance seed/propagule dispersal (5 pts.) 		1,9: Seeds and pollen dispersed by wind. 10: spikelets can disperse 800m, but species can also disperse and establish over 1 km from	

Ohio Invasive Plant Assessment Protocol

Botanical Name: *Miscanthus sinensis*
 Common Name: Chinese Silvergrass, Eulaliagrass Step I Outcome: **Continue**
 Family Name: Poaceae Step II Score: **49**
 Posted Date: 7/20/16 Step II Outcome: **Invasive**
 Assessment conducted by: lyn Morgan and Theresa C

Score **Notes** **References**

Step II

<ul style="list-style-type: none"> - Information unknown (U) 	5	original ornamental plantings within 20 yrs of introduction. 16: In a seed dispersal study, most spikelets were captured within 50m of the source plant but a small percentage were captured at 300m (modeling shows that the spikelets can travel long distances).	1,9,10,16,17
<p>9. Generation Time</p> <ul style="list-style-type: none"> - long juvenile period (>5 or more years for trees, 3 or more years for other growth forms) (0 pts.) - short juvenile period (<5 years for trees, <3 years for other forms) (3 pts.) - Information unknown (U) 	0	18: inflorescences were collected "from field grown, mature (usually 3-or-more-year-old) plants".	1,6,18
<p>10. Establishment</p> <ul style="list-style-type: none"> - unable to invade natural areas (0 pts.) - can only colonize certain habitat stages (e.g. early successional habitats) (1 pt.) - aggressively colonizes and establishes in edge habitats (3 pts.) - aggressively colonizes and establishes in intact and healthy natural areas (6 pts.) - Information unknown (U) 	3	1: Seems to be able to go anywhere, tolerates a lot of non-favorable soil conditions compared to other plants. 9: is an early colonizer after ecological disturbance in environments that would otherwise support forests. 10: can invade disturbed sites as well as unmanaged forest edges and "more rarely forest interiors"; is a drought-tolerant species that is most likely affected by temperature. 12: The species is relatively tolerant of post-emergence herbicides such as imazethapy and imazamox. 20: In its native range, <i>M. sinensis</i> acts as "a pioneer species, colonizing and eventually dominating heavily disturbed volcanic sites and clear-cuts". 21: "M. sinensis can tolerate extremely wide variation in soil and climate conditions in the populations we sampled across both range."	1,9,10,12,20,21
Step II: Ecological Importance			
<p>11. Impact on Ecosystem Processes</p> <ul style="list-style-type: none"> - no known effect on ecosystem-level processes (0 pts.) - moderate effects on ecosystem-level processes (e.g., changes in nutrient cycling)(3 pts.) - causes long-term, substantial alterations in the ecosystem (e.g., changing fire regime of an area, changing hydrology of wetlands) (6 pts.) 	3	1: Very significant fire hazard	1
<p>12. Impact on Rare Organisms</p> <ul style="list-style-type: none"> - no known negative impact on Ohio State-listed or federal-listed plants or animals (0 pts.) - negatively impacts listed species, such as through displacement or interbreeding (3 pts.) 	0		1,4,6
<p>13. Impact on Native Animals</p> <ul style="list-style-type: none"> - no known negative impact on animals (0 pts.) - documented direct or indirect negative effects on animal taxa (3 pts.) 	0		
<p>14. Impact on Native Plants</p>			

Ohio Invasive Plant Assessment Protocol

Botanical Name: *Miscanthus sinensis*
 Common Name: Chinese Silvergrass, Eulaliagrass Step I Outcome: **Continue**
 Family Name: Poaceae Step II Score: **49**
 Posted Date: 7/20/16 Step II Outcome: **Invasive**
 Assessment conducted by: lyn Morgan and Theresa C

Score Notes References

<ul style="list-style-type: none"> - no known negative effects on native plants (0 pts.) - negatively impacts some native plants (increasing their mortality and/or recruitment of certain taxa) (3 pts.) - impacts native plants to such an extent that community structure is greatly altered (6 pts.) 	3		1,6,20
<p>15. Hybridization</p> <ul style="list-style-type: none"> - no known instances of hybridization with other plant species (0 pts.) - can hybridize with native Ohio plants or commercially-available species, but seeds are inviable (1 pt.) - can hybridize with native Ohio plants or commercially-available species, producing viable seed (3 pts.) 	3	<p>9: Used as a parent to produce the hybrid, known as giant miscanthus; used for bioenergy feedstock. Naturalized population in US are derived from ornamental cultivars. 14: Species has hybridized with <i>M. sacchariflorus</i> in China to form <i>M. purpurascens</i>. 18: New cultivars "show characteristics of natural hybridization".</p>	9,14,18
<p>16. Population Density</p> <ul style="list-style-type: none"> - occurs only as small, sporadic populations or individuals (1 pt.) - typically forms small, monospecific patches (3 pts.) - is a dominant plant in area where population occurs (absolute cover 15-50%) (4 pts.) - forms an extensive, monospecific stand (absolute cover >50%) (5 pts.) 	4	<p>20: In Ohio, density at one site was 6,282 plants per ha. 10: Across the US range, average estimated popn was 9,437 individuals with average density of 86 plants per 100 m². 15: Relatively large popns can be dense (15,075 individuals/ha).</p>	1,10,15,20
<p>17. Role in Succession in Natural Areas</p> <ul style="list-style-type: none"> - successional information is unknown (0 pts.) - is an early successional species that temporarily invades a disturbed site but does not persist as the site matures (0 pts.) - readily invades disturbed sites and persists, but does not interfere with succession (1 pt.) - readily invades disturbed sites, persists and interferes with succession of native plants (4 pts.) 	1	<p>20: In its native range, <i>M. sinensis</i> acts as "a pioneer species, colonizing and eventually dominating heavily disturbed volcanic sites and clear-cuts"; can displace grasses and dominate roadsides and pastures.</p>	1,20
<p>18. Number of Habitats Invaded</p> <p><u>Forestlands:</u> Floodplain forest, hemlock-hardwood forest, mixed mesophytic forest, beech-maple forest, oak-maple forest, oak-hickory forest.</p> <p><u>Grasslands:</u> Alvar*, beach-dune community*, bur oak savanna*, slough-grass-bluejoint prairie*, sand barren*, big bluestem prairie, little bluestem prairie (xeric limestone prairie*+), post oak opening*+</p> <p><u>Wetlands:</u> Bog*, fen*, twigrush-wiregrass wet prairie*, marsh, buttonbush swamp, mixed shrub swamp, hemlock-hardwood swamp*, maple-ash-oak swamp, white pine-red maple swamp*</p> <p>* Considered a rare plant community in Ohio by ODW's Biodiversity Database Program.</p> <p>+ = xeric limestone prairies or cedar glades and post oak openings are unique to the Interior Low Plateau Region of Adams, Highland and Pike counties, and are not included in Schneider and Cochrane (1997).</p> <ul style="list-style-type: none"> - not found in any natural habitats in Ohio (0 pts.) - only found in 1 broad category (1 pt.) - found in 2 broad categories or 2 rare habitat types (3 pts.) - found in 3 broad categories or 3 rare habitat types (4 pts.) 		<p>10: Across the US range, invaded habitats consisted of forest edges, forest understories, open fields, and road/railroad</p>	

Ohio Invasive Plant Assessment Protocol

Botanical Name: *Miscanthus sinensis*
 Common Name: Chinese Silvergrass, Eulaliagrass Step I Outcome: **Continue**
 Family Name: Poaceae Step II Score: **49**
 Posted Date: 7/20/16 Step II Outcome: **Invasive**
 Assessment conducted by: lyn Morgan and Theresa C

Score Notes References

- found in 4 or more rare habitat types (5 pts.)	3	right of ways. 13: Species possesses photosynthetic traits that allow it to persist in low light, forested habitats. 15: But species is just as shade tolerant in US as in native Japan. 3: Species can tolerate extremely wide variation in soil and climate conditions (including potential toxic Al levels); species can exist in the shade in the US.	1,3,10,13,15
---	---	---	--------------

Total Score: 49
Number of Unknowns: 0
Outcome: Invasive

Total Points	Assessment Decision
4 or more U	Insufficient Data
0-34	Not Known to be Invasive
35-44	Pending Further Review
45-80	Invasive