

Ohio Invasive Plant Assessment Protocol

Botanical Name: *Morus alba*
 Common Name: White Mulberry
 Family Name: Moraceae
 Assessment conducted by: OIPC Team

Step I Outcome: **Invasive**
 Step II Score: **40**
 Step II Outcome: **Pending Further Review**

Score

Notes

References

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

Step I

1. Is this plant known to occur in the state and listed as "noxious" on any federal or Ohio Department of Agriculture plant list?

Yes. Place on invasive plant list, no further investigation needed. **STOP**

No. Continue on to question 2.

X

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

Yes. Place on invasive plant list, no further investigation needed. **STOP**

No. Continue on to question 3.

x

Species has naturalized in natural areas, but pop sizes have not been documented.

1,2,7

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?

Yes

No

Unknown

x

Species has naturalized in natural areas. It is considered a threat to the native red mulberry, due to its ability to hybridize with it. Note that this species is considered more of a problem in areas of no-till farming than in forests (where its pops tend to be low).

1,2,7,8

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}

Yes

No

Unknown

x

IN,PA (on "watch" list) [on KY's list but not counted here]

3,4,6

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.

1. Current Invasion in Ohio

- 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**)

3

1,2,7

2. State Distribution^a

- 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)

5

Naturalized in all but 2 counties.

1,2

3. Regional/US Distribution

- 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.)
- plant has been reported to be a widespread problem in similar habitat outside the US (1 pt.)
- Information unknown (U)

3

IN,PA (on "watch" list) [on KY's list but not counted here]

3,4,6

Step II: Biological Characters

4. Vegetative Reproduction

- 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)

0

8

5. Sexual Reproduction

- 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

Species produces seeds annually, but no evidence to conclude that seed production varies among years. 10=>pollen is rapidly ejected from the stamen in a "puff of smoke" and is typical of wind-pollinated species. [More long-term research on seed output could change this answer to a 5pt answer.]

7,8,9,10

6. Number of Viable Seeds or Propagules per Plant

- few (0-10) (1 pt.)
- moderate (11-1,000) (3 pts.)
- prolific (>1,000) (5 pts.)
- Information unknown (U)

3

It is clear that plants produce more than 11 viable seeds per year from these two refs, but actual average seed set numbers are not reported.

8,9

7. Flowering Period

- 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)

1

Flowering occurs for 2-3 months. Ref 8 states that duration is generally 2 months, thus the 1pt answer.

7,8

Step II

8. Dispersal Ability

- 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.)
- Information unknown (U)

5

Dispersed by birds, mammals, and humans; OIPC team members have seen birds such as cedar waxwings taking seeds long distances.

7,8

9. Generation Time

- 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)

U

Refs state that species is fast growing, but average maturation age is not provided.

7,8,9

10. Establishment

- 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

Species has been observed within different habitat stages (not only in early successional habitats), but its pop levels outside of early successional habitats appeared to be low (i.e. not aggressive).

8

Step II: Ecological Importance

11. Impact on Ecosystem Processes

- 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.)

0

There is little evidence that supports ecosystem-level process alterations. The species has been observed once forming a dense thicket that excluded understory vegetation (in S. Carolina) but all other observations maintains that the sp. rarely becomes dominant in natural areas.

8

12. Impact on Rare Organisms

- 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

no evidence

13. Impact on Native Animals

- no known negative impact on animals (0 pts.)
- documented direct or indirect negative effects on animal taxa (3 pts.)

0

no evidence

14. Impact on Native Plants

- 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.)

Species hybridizes with native red mulberry. There is evidence that the white mulberry species is acting as a "genetic sink" to the red

7,8,9

- impacts native plants to such an extent that community structure is greatly altered (6 pts.)

15. Hybridization

- 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.)

16. Population Density

- 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.)

17. Role in Succession in Natural Areas

- 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.)

18. Number of Habitats Invaded

Forestlands: Floodplain forest, hemlock-hardwood forest, mixed mesophytic forest, beech-maple forest, oak-maple forest, oak-hickory forest.

Grasslands: Alvar*, beach-dune community*, bur oak savanna*, slough-grass-bluejoint prairie*, sand barren*, big bluestem prairie, little bluestem prairie

Wetlands: Bog*, fen*, twigrush-wiregrass wet prairie*, marsh, buttonbush swamp, mixed shrub swamp, hemlock-hardwood swamp*, maple-ash-oak swamp,

* Considered a rare plant community in Ohio by ODW's Biodiversity Database Program.

† = 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 Cochran (1997).

- 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.)
- found in 4 or more rare habitat types (5 pts.)

3 species is acting as a genetic sink to the red mulberry, causing the red mulberry pops to decline - and possibly become locally extinct. 7,8,9

3 see notes for Question 14. 7,8,9

3 7,8

1 8

4 8=>"In central Ohio, white mulberry occurs most frequently in mixed-hardwood forests, which may be in riparian, floodplain, or unplan areas. White mulberry also occurs in some coniferous forest types, old fields, and prairie plant communities. In southeastern Ohio, white mulberry was a rare species in floodplain forests dominated by silver maper, boxelder, American elm, American sycamore, black walnut, and Ohio buckeye."

Total Score:
Number of Unknowns:

40
1

Outcome:

Pending Further Review

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