

Ohio Invasive Plant Assessment Protocol - 2015

Botanical Name: *Melilotus alba*
 Common Name: White sweet clover
 Family Name: Fabaceae
 Assessment conducted by: Allison Mastalerz, Theresa Culley

Step I Outcome: **Invasive**
 Step II Score: **50**
 Step II Outcome: **Invasive**

Team Score

Notes

References

Step I

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

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?
 Yes. Place on invasive plant list, no further investigation needed. **STOP**
 No. Continue on to question 3.

x

Species occurs in all 5 regions, but information about individual populations is lacking.

1

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

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, MI

1,2,3,4,5,6

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

7

2. State Distribution*

- 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

In all 5 regions of OH

1

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, MI

3,4

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

7

5. Sexual Reproduction

- no sexual reproduction (0 pts.)
- infrequent sexual reproduction (1 pt.)

Biennial species - seed production varies based on many

Step II

- 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)

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)

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)

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)

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)

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)

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.)

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.)

13. Impact on Native Animals

- no known negative impact on animals (0 pts.)

- documented direct or indirect negative effects on animal taxa (3 pts.)

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.)

3 interacting factors (weather, soil conditions, plant spacing, number of pollinating insects). 7

5 14,000 to 350,000 seeds per plant, although some sources believe this to be an overestimate and state that seed production is more likely a few thousand per plant. 7,9

1 June and July 7

3 7: "Rain was and stream flow are probably much more important [than wind] for dispersal". Species is dispersed by animals, especially along trails and livestock corridors. Seeds occurring in calf, sheep, chicken, hog and deer feces were still able to germinate. 9: species is still widely planted. 7,9

3 Species is an annual or biennial 7,9

6 7: "quickly colonizes freshly disturbed soils on well-drained river banks, construction sites etc." 7,8,9

3 Species is a nitrogen-fixing species and can change the nutrient cycling and content of an area. Some contend that species can create long-term substantial alterations in the ecosystem, but more documented impacts are necessary for the 6 point answer. 7, 10,11

3 12: Impacts rare blazing star in Ohio 12

0 Is know to cause harm to livestock, particularly cow, when spoiled sweet-clover hay or ensilage is eaten. As livestock is not considered "native" the zero point answer is selected. Species is a weed in hay fields and when consumed by livestock, can cause 'sweet-clover disease' also known as 'bleeding disease', however, if properly harvested, is considered a roughage of considerable value. 7,9

3 9: "In many prairies, sweet clover is associated with displacement of native species by limiting sunlight and 7,9

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

displacement of native species by limiting sunlight and moisture and changing nutrient availability. Some have referred to white sweet clover as the prairie "restorationists nightmare." Further, species "has the potential to form dense stands, prevent native plant establishment, alter community structure and disrupt succession." And "Several native prairie forbs (pride of Ohio [shooting star] [Dodecatheon meadia], Canadian lousewort (Pedicularis canadensis), tall cinquefoil (Potentilla arguta), and Virginia mountain mint (Pycnanthemum virginianum) were negatively associated with white sweet clover (P<0.01) in southeastern Wisconsin's tallgrass Chiwaukee Prairie". Ref 10: "Dense patches of sweetclover have the potential to alter native seedling recruitment."

9,10

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.)

0

7

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.)

4

Can occur in dense stands or in small monospecific patches, based on environmental conditions, so 4 point answer was selected.

7,9,10

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.)

1

8: "Species is known to produce high amounts of biologically fixed N...Increased nutrient availability can facilitate invasion by other alien species that are not adapted to low nutrient levels or shift the pattern of plant dominance during succession." but other studies have shown that species will not persist into later seral stages. Ref. 10 states that species creates a novel shade environment in Alaska floodplains that impacts early seral floodplain plant communities which could alter community composition. More documentation is needed to increase this question's score.

8,9,10

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 (xeric limestone prairie*+), post oak opening*+

Wetlands: Bog*, fen*, twigrush-wiregrass wet prairie*, marsh, buttonbush swamp, mixed shrub swamp, hemlock-hardwood swamp*, maple-ash-oak swamp, white pine-red maple 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 Cochrane (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.)

4

Occurs on riverbanks and prairie grasslands

7

Total Score: 50

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