

Ohio Invasive Plant Assessment Protocol - 2015

Botanical Name: *Vincetoxicum nigrum* (syn. *Cynanchum louiseae*) *species taxonomy is confused in the literature, but *Vincetoxicum nigrum* (L.) Moench
 Common Name: Black swallow-wort Step I Outcome: **Continue**
 Family Name: Apocynaceae Step II Score: **47**
 Assessment conducted by: Allison Mastalerz, Theresa Culley 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

Occurs in regions 1,3, and 5, but information regarding individual populations sizes is unclear.

1,7

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

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

PA, IN (Prohibited in MA & CT)

1, 2,3,4

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

8,10

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)

3

Regions 1,3,5

1,7,15

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

PA, IN, Prohibited in MA & CT

1,2,3,4

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.)

3

11: Species exhibits vegetative reproduction by "expanding vegetatively from the root crown". 12: Forms short rhizomes ("but not a creeping rhizome"): rhizomes

- 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)

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)

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.)

short rhizomes (but not a creeping rhizome), rhizomes assist perennation but do not seem to facilitate population spread. 13: Root structures in this species similar to pale swallow-wort but "tend to be thicker and more fibrous, and rhizomes in this species are reported to contribute more significantly to population expansion". 14: "Plants are clonal, from deep rhizomes" and that what appeared to be several plants "were often one, connected by horizontal underground stems".

8, 10,11,12,13,14

5

11: Seed production averages 10 seeds per follicle and multiple follicles per plant; reproduces over several months. 13: has high seed output potential.

9, 10,11,13

5

11: Individual plants frequently have more than 10 stems, and a NY study found that there were "100 ± 10 viable seeds stem⁻¹ yr⁻¹"

9, 10, 11

2

8-9. mid-May to mid-July. 12. In NY, flowering began in late May, peaked in mid-June and ended in mid-July (can persist until August in some shaded locations in more southerly sites). 13: peak flowering is in mid to late June although it can be delayed by up to one month in shadier locations. 14: In NY, flowering season began in late May

8, 9,12,13,14

5

Seeds have appendage to facilitate wind dispersal. 12: have windbourne, polyembryonic seeds facilitating long-distance dispersal and seedling establishment. 14: Seeds are wind-dispersed.

8,9,10,12,13,14

0

11: May take over 4 years to go from seed to reproductively mature. 16: Some seedlings grown from seed did reproduce in their first year.

10,11,16

3

9: "an Element Stewardship Analysis for black swallow-wort indicates that naturally disturbed habitats—such as the ice-scoured banks of the Connecticut River, streambanks exposed to forceful spring snowmelts, and globally rare alvar systems exposed to severe flood and/or drought hydrologic cycles—may be potential invasion sites for black swallow-wort. Ecological disturbances that create canopy gaps in a forest environment would likely stimulate increased growth and reproduction of existing swallow-wort populations." Species is much more likely to establish in high light habitats. 11: Species likely to invade disturbed habitats.

9,10,11

3

13: "Once established...grow profusely and

- 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.)
- 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.)

aggressively...can rapidly alter the abiotic and biotic features of their understory and surrounding areas: decreasing sunlight penetration, increasing nutrient acquisition through large root biomasses, and altering rhizosphere dynamics both through shifts in the AMF community and the exudation of allelopathic chemicals".

13

0

No known impacts in Ohio

3

9: "Because of the similarity of swallow-worts to the monarch butterfly's native host, common milkweed (*Asclepias syriaca*), the potential for invasive swallow-worts to negatively impact monarch populations is receiving research attention. In both laboratory and field settings, monarch larvae that were either ovideposited on or given one of the swallow-worts for food rarely survived. However, in laboratory ovideposition tests, monarchs showed a strong preference for native milkweed hosts and usually avoided ovidepositing on either black or pale swallow-wort. In examinations of old fields in Rhode Island, it was difficult to find intact monarch eggs on black swallow-wort. Egg densities on black swallow-wort were greatest in areas where common milkweed was relatively rare. Due to the results of these studies, it is suggested that the main threat to monarch populations is not inappropriate ovideposition, but the potential of the nonnative swallow-worts to displace native milkweed populations. Both factors may interact to create an ovideposition sink for monarchs, though the impact may vary by region." 11: This species is detrimental to the Monarch butterfly because their larvae cannot survive on this plant.

9,11,13

3

11: can form dense stands that reportedly suppress resident vegetation. 13: swallow-wort can displace resident flora dependent on native fungal species; species is putatively allelopathic.

8,9,10,11,13

0

12: Although species can hybridize with introduced *C. rossicum*, it is unlikely to occur in North America. 13: various introduced swallow-wort species are able to hybridize but not mention of natives (and species is no longer commercially available).

9,12,13

3

11: The species can form dense stands where they become established (at least in New England and NY). 12: Species may "dominate in the herbaceous vegetation, however plant densities are usually considerably less in shaded habitats under forest canopies than in sunny locations".

8,9,10,11,12

1

9: "swallow-worts are a particular threat in wooded remnants with large edge to interior ratio, and open habitats which contain native plant communities." And

- readily invades disturbed sites, persists and interferes with succession of native plants (4 pts.)

"Authors have observed that swallow-wort populations can establish in disturbed, early-successional areas and then spread into adjacent, undisturbed, later-successional habitats"

9

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.)

2

Occurs in wide range of habitats: wooded ravines, talus, alluvial woods, forest edges, pastures, grasslands, coastal areas, roadside areas. 11: Found in disturbed sites in North America, including "recently abandoned agricultural fields and roadsides" as well as "rocky shaded outcrops and old fields, but rarely found in heavily shaded forests. 12: In North America, the species is found in "disturbed and waste areas, such as transportation corridors, limestone quarries, abandoned pastures and old fields, Christmas tree plantations and other perennial cropping systems. Also found in prairies, maple-beech woods and swampy meadows.

8, 10, 11,12,16

Total Score: 47

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