

Ohio Invasive Plant Assessment Protocol - 2015

Botanical Name: *Barbarea vulgaris*
 Common Name: garden yellowrocket, bittercress, winStep I Outcome: **Continue**
 Family Name: Brassicaceae Step II Score: **37**
 Assessment conducted by: n Mastalerz and Theresa (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? Yes. Place on invasive plant list, no further investigation needed. **STOP**
 No. Continue on to question 3.

X

Species is widespread in all 5 regions, but population size measurements were not found for Ohio. 1,2

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 forms self-replicating populations, but impacts to ecological processes and functions are unclear 1,2

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

CT, IN, MI, NH, WI, considered a "lesser threat" in KY 3,4,5,6,7

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

Species is not cultivated. 8

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

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, MI. "Barbarea spp. Is listed as a primary noxious weed under the Canada Seeds Act" and several other provinces in Canada list the species on their noxious weeds lists. 7,8

Step II: Biological Characters

4. Vegetative Reproduction

- no vegetative reproduction (0 pts.)
- reproduces readily within the original site (1 pt.)

8: "New rosettes can develop from vegetative buds on the root

- 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)

1 8. New rosettes can develop from vegetative buds on the root system. Rosettes arise similarly from root fragments exposed to sunlight." 13: the species is capable of root-sprouting. 8,13

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)

5 Species is a biennial. It is sometimes observed as a winter annual. 8,9,16

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)

5 8: Seed production varies based on environmental conditions, but individuals in moderate conditions can average 38,000 seeds. 8

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 16: blooms in the summer in VA; 17-19: blooms from April to early May 16,17,18,19

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.)

3 8: Seeds are ejected through dehiscence of the siliqua valves and disperse on average approx. 1 meter from the parent plant. Species seeds, when moistened, form a sticky surface that either allows the seed to attach to an animal, or attaches to soil particles and can potentially be dispersed long distances. 8,10

- 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)

3 8: Species is normally a biennial (stay as a rosette the first year and then flowers the second year) 8

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.)

1 10: Seeds of this species were found in a seed bank but not in the overstory vegetation at a site deep within a national forest in southern IL. Because the establishment is not technically "aggressive", the 1 pt answer is selected. 13: Species is extremely resilient - for example, 100% of all individuals grew quickly back to original biomass after the above ground biomass was removed. 15: the species can respond quickly after herbivore damage and pathogen infection and can compensate for biomass loss. 16: The species is very tolerant of aboveground clipping and can quickly compensate for loss of growth. [This answer is conservative and the score may increase as more information becomes known about this species in OH.] 8,10,13,15,16

- 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.)

0 No evidence

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.)

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.)

- 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 (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.)

3

11: This species produces glucosinolate compounds which reduce the survival of the diamondback moth larvae (*Plutella xylostella*). 14: This species is the host plant for the onion thrip, a carrier of the iris yellow spot virus.

11,14

0

There is no evidence for effects on plants in natural areas. The species is well documented in reducing crop yields (see ref 8), but its success in natural areas is unclear.

8

0

"Given the taxonomic difficulties with this genus, the possibility of hybridization is difficult to evaluate."(8) But there are no documented instances of hybridization.

8

3

8: "...weediness is based on a combination of rapid increase in numbers.....and intermittent recruitment".

8,10

0

Species is recognized as an "important weed of small-seeded grain and hay crops." It reduces crop yield. But it does not appear to interfere with succession(8)

8

1

13: Species prefers man-made (ditches, railway banks, etc.) or naturally disturbed habitats (river alluvia). 16: In VA, it is found in "recently disturbed habitats (such as roadsides) as well as in gaps and margins of woodlands." [This answer is conservative for OH and refers to only open, disturbed habitats until more information is known.]

8,13,16

Total Score:

37

Number of Unknowns:

0

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