

Ohio Invasive Plant Assessment Protocol - 2015

Botanical Name: *Bromus inermis*
 Common Name: Smooth brome grass
 Family Name: Poaceae
 Assessment conducted by: Allison Mastalerz, Theresa Culley

Step I Outcome: **Invasive**
 Step II Score: **58**
 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 is in all but one county in Ohio, but information regarding density of stands is lacking.

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

Upon completion of Step II, this question should be answered in the affirmative

See Step II answers

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, WV (Moderately invasive species),

3, 5,

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

15: "It is relatively common in Ohio, and can be found in fields, waste places and roadsides."

15

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

7

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)

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IN

3

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)

3

20: Proliferation of rhizomes

9,12,14,15,20,21

5. Sexual Reproduction

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

Smooth brome has variable germination rates from seed. 13: "Fertility among populations of

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	smooth brome ranges between 2.6 and 75.8%". 21: Reproduces sexually through outcrossed wind pollination and clonally through an underground rhizome.	11,13,20,21
3	Seed set described as prolific, but data including numeric values lacking, therefore 3 point answer is used. 24: There is a seed bank ahead of the invasion front.	10,11,13,14,15,24
2	15: Late May to September. 20: June to September in Ontario, Canada.	15,20
3	Most seeds fall within a meter of parent plant, but can seeds can be transported by water, allowing for moderate potential for long-distance seed dispersal. 15:"can be spread by wind, water, birds and mammals". Species is planted for erosion control and forage. 20: Seeds are wind dispersed, but may not disperse beyond several meters from invading clones; seeds may also attach to animal fur.	13,14,15,20
3		11
3	Smooth brome needs fertile soils to persist, and is more prevalent in moderate to highly disturbed areas	11,13,14,21,23
6	8: alters nitrogen cycling and carbon storage, lower plant diversity, and shift seasonal forage production. 10: alters soil microbial communities. 13:"smooth brome (Bromus inermis Leyss.), a Eurasian perennial threatening the structure and function of native prairie remnants". The increased litter created by smooth brome affects the availability of mineral resources, light and water in prairie sites.	8,10,12,13,22,23
0	Information lacking (this species may impact Royal Catchfly in OH but citation is needed.	
3	Monospecific stands impacts trophic structures that in turn negatively impact livestock production and wildlife habitat. 18: Refers to other studies which show that brome significantly impacts movement and population dynamics of several native arthropod species.	8,13,18,20
6	3: "Smooth brome has been widely planted as a forage and cover crop. It is highly persistent. It	

- 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.)

forage and cover crop. It is highly persistent. It forms a dense sod that often appears to exclude other species, thus contributing to the reduction of species diversity in natural areas." 12: "reduces grassland plant diversity by up to 70%" and suppresses growth of the forb *Solidago canadensis* L." 16: is able to "exclude virtually all other species, forming dense monocultures"; 18: Reduces growth of native prairie cordgrass, *Spartina pectinata*, in eastern North Dakota. 20: Species often escapes and poses threat to the biodiversity of revegetated and natural areas.

3,8,9,10,12,13,14,16,18,19,20,22,23

0

20: Hybridization only occurs with other *Bromus* species.

20

5

Species creates dense, monospecific stands. 3:"Smooth brome has been widely planted as a forage and cover crop. It is highly persistent. It forms a dense sod that often appears to exclude other species, thus contributing to the reduction of species diversity in natural areas". 24: appears as "nearly monocultural stands in seeded pastures, roadside ditches, railroad right-of-ways, and along fencelines."

3,8,10,13,14,16,24

4

Species readily invades disturbed habitats, creates monotypic stands and persists. A stand in West Virginia has clonally persisted for at least 60 years.

11,12,13,14

3

grasslands, riparian zones (immature and mature cottonwood stands), and forests. 17: invades both native cool- and warm-season grasslands throughout North America

8, 9,11,12,17,23

Total Score: 58

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