

Ohio Invasive Plant Assessment Protocol

Botanical Name: *Lonicera maackii*
 Common Name: Amur Honeysuckle
 Family Name: Caprifoliaceae
 Assessment conducted by: OIPC Team

Step I Outcome: **Invasive**
 Step II Score: **65**
 Step II Outcome: **Invasive**

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

x

Species has been observed as naturalized in all 5 regions. Is documented as widespread in region 5. Based on observational data from R. Gardner, T. Culley, D. Brandenburg, J. Cardina, R.. Munson

1,2,7,8

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

x

No

1,2,7,8

Unknown

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

x

No

IN,MI,PA [also in KY but not included here]

3,4,5,6

Unknown

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

1,2,7,8

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

Regions 1,2,3,4,5

1,2,7,8

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)

5

IN,MI,PA [also in KY but not included here]

3,4,5,6

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

No evidence

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

9=>abundant annual fruit set. 24=> detailed study of floral pollination and seed production.

9,24

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

10=>up to 1.2 million seeds per plant. 24=> "fruits are small, fleshy berries, containing 1–10 seeds, that ripen in November. Individual branches can produce hundreds of fruits." and plants in edge habitats produce more fruit.

10,24

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

24=> in May and early June for 3–5 wk.

10,24

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

birds and humans. 19=> deer dispersal. 25=> rodents.

7,8,9,10,19,25

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)

0

10=>begins reproduction in 3rd or 4th year

10

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)

6

aggressively invades edges and interiors of early and mid-successional forests

7,8

Step II: Ecological Importance

11. Impact on Ecosystem Processes

- no known effect on ecosystem-level processes (0 pts.)

6

Reduces native species richness and density. This can occur to such an extent that the understory plant community is virtually absent. 13=> honeysuckle leads to increased human exposure to tick-bourne disease because sites are frequented by deer, which increase tick abundance in area. 14=> leaf litter had significantly higher nitrogen, lower C:N, and lower lignin than the other species, and decomposition rates were greater than 59 faster; this leads to a distinct microbial community; also "alters tree regeneration, negatively affects herb-layer biodiversity, and alters ecosystem function." 17=> leaves decompose significantly faster than two native species (21X faster than oak). 18=> honeysuckle had higher transpiration rates in wetland forests, which is expected to "shorten the lives of ephemeral ponds and streams in wetlands and cause adverse impacts on the organisms, such as amphibians, that require these aquatic environments to complete their life cycle." 7=> impacts tree seedlings. 26=> produces leaves before other plants in early spring and retains its leaves for longer in the fall. 30=> "L. maackii significantly reduced the volume of rainwater arriving at the forest floor and altered the chemistry of that rainwater causing an increase in cation concentrations and a reduction in NH4+-N. These results suggest that L. maackii invasion has

7,8,10,13,14,17,18,26,28,30,32,33,35,36,38

- 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.)

These results suggest that *L. maackii* has the potential to cause significant alterations to nutrient cycling in forests." 32=> "L. maackii leaf breakdown was significantly faster than native leaves in headwater streams, and colonization of macroinvertebrates was variable depending on leaf pack species composition. These results support the hypothesis that *L. maackii* can have direct and significant impacts on aquatic ecosystems by influencing organic matter availability and macroinvertebrate community dynamics." 33=> *L. maackii* can alter decomposition dynamics of leaf litter in natural areas. 35=> plant-soil feedback differs depending on the type of soil.

3

Heritage data for wall flower and other state listed plants in SW Ohio.

39

11,38=> *Anaxyrus americanus* tadpoles had increased mortality when reared in amur honeysuckle extracts. 13=> honeysuckle leads to increased human exposure to tick-borne disease because sites are frequented by deer, which increase tick abundance in area. 15=> Cardinal fledglings "moved less from nests surrounded by extensive cover of the Amur honeysuckle but size of natal ranges of juvenile flycatchers was

- 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

3

positively related to honeysuckle cover. " 20=> negatively impacted some, but not all, ground-dwelling arthropods. 22=> honeysuckle presence affects the foraging and predation behavior of small and medium-sized mammals. 26=> "linked to an increase in mortality rates of songbird nests near watersheds, particularly in more urban landscapes". 27=> "While L. maackii experienced little herbivory in the field compared to native relatives in the same habitat, laboratory assays indicate L. maackii appears to be a suitable host that escapes." 34=> cardinal nests had the lowest survival rates in early spring in L. maackii, but exceeded rates of native species later in the season. 37=> presence of L. maackii associated with lower amphibian species richness, evenness, and alterations in species composition.

11,13,15,20,22,26,27,34,37

6

8=>"We, however, found sites which were long-invaded by Lonicera maackii and consisting only of overstory trees and L. maackii shrubs. In sites that were long-invaded by L. maackii...forests are virtually two-tiered systems consisting only of overstory trees and L. maackii shrubs with few plants in the understory and midstory recruitment strata." 12,21=>species is allelopathic. 16=> honeysuckle is allelopathic but effect is context-dependent. 7=> "Despite this protective function of L. maackii shoots [for Q. rubra shoots], the overall effect of this invasive shrub is increased mortality of native tree seedlings, suggesting it impacts the natural regeneration of secondary forests." 29=> L. maackii extracts inhibit germination of some, but not all, herb species. 31=> L. maackii negatively impacts Geranium maculatum.

7,8,10,12,16,21,29,31

0

No evidence

- 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

* 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,

- 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.)

5

23=> 1136 plants/acre (heavily colonized). 24=> at two sites in OH, density was 0.46-0.66 plants per m2.

7,8,10,23,24

4

see responses for Question 11. 8=> in honeysuckle infested areas, "we found significantly reduced densities in the herb (-57%), seedling (-58%), and sapling layers (-90%), and also reduced species richness in the seedling (-34%), and sapling (-58%), and herbaceous layers (-4%)."

8,10

3

mixed hardwood forests and bluestem prairies

10

Total Score:

65

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