



***Plant Risk Evaluator -- PRETM
Evaluation Report***

Euonymus fortunei -- Illinois

2017 Farm Bill PRE Project

PRE Score: 16 -- Reject (high risk of invasiveness)

Confidence: 79 / 100

Questions answered: 19 of 20 -- Valid (80% or more questions answered)

Privacy: Public

Status: Completed

Evaluation Date: October 14, 2017

This PDF was created on June 15, 2018



Plant Evaluated

Euonymus fortunei



Image by James H. Miller, USDA Forest Service



Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Euonymus fortunei*) in an effort to understand the invasive history, reproductive strategies, and the impact, if any, on the region's native plants and animals. This research reflects the data available at the time this evaluation was conducted.

Summary

Euonymus fortunei is already listed as invasive in Illinois and this evaluation confirms that status. Its invasive behavior and impacts on native plant communities in similar climates present a high risk to the region. This plant has rampant vegetative growth and can also reproduce by seed, which is dispersed by birds. Seeds and fragments can also be dispersed by water. More information would be useful on the quantity of seed produced as well as viability and germination tests, which were not available.

General Information

Status: Completed

Screener: Emily Russell

Evaluation Date: October 14, 2017

Plant Information

Plant: *Euonymus fortunei*

Regional Information

Region Name: Illinois



Climate Matching Map

To answer four of the PRE questions for a regional evaluation, a climate map with three climate data layers (Precipitation, UN EcoZones, and Plant Hardiness) is needed. These maps were built using a toolkit created in collaboration with GreenInfo Network, USDA, PlantRight, California-Invasive Plant Council, and The Information Center for the Environment at UC Davis.

Click [here](#) to see the generated climate matching map for this region. This climate match database is hosted by GreenInfo Network and publicly accessible.



Evaluation Questions

These questions are based in an original article published at the University of California, Davis, and can be found on the PLOS One website, here: <https://doi.org/10.1371/journal.pone.0121053>

Invasive History and Climate Matching (Questions 1 - 6)

1. Has the species (or cultivar or variety, if applicable; applies to subsequent "species" questions) become naturalized where it is not native?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeners* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Euonymus fortunei is naturalized across the Eastern United States.

Reference(s):

- Kartesz, J. T. (2015). The Biota of North America Program (BONAP).
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2. Is the species (or cultivar or variety) noted as being naturalized in the US or world in a similar climate?

- Answer: **Yes**, which contributes **2** points to the total PRE score.
- The *screeners* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Euonymus fortunei is naturalized in Illinois, as well as the Midwest, Mid-Atlantic, and Northeast where there is climate overlap with Illinois.

Reference(s):

- Kartesz, J. T. (2015). The Biota of North America Program (BONAP).



3. Is the species (or cultivar or variety) noted as being invasive in the U.S. or world?

- Answer: **Yes**, which contributes **2** points to the total PRE score.
- The *screeners* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

"Winter creeper has been reported to be invasive in natural areas in most of the states in the eastern half of the U.S." (NPS) In the Midwest, it is listed as invasive in Illinois, Indiana, Missouri, and Ohio.

Reference(s):

- Midwest Invasive Plant Network (2015). Midwest Invasive Plant List.
 - Swearingen, J., Slattery B., Reshetiloff K., & Zwicker S. (2010). Plant Invaders of Mid-Atlantic Natural Areas. 168.
-

4. Is the species (or cultivar or variety) noted as being invasive in the US or world in a similar climate?

- Answer: **Yes**, which contributes **3** points to the total PRE score.
- The *screeners* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Euonymus fortunei is listed as invasive in Illinois, Indiana, Missouri, and Ohio.

Reference(s):

- Midwest Invasive Plant Network (2015). Midwest Invasive Plant List.
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5. Are other species of the same genus (or closely related genera) invasive in a similar climate?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Euonymus alatus is also invasive in the Midwest, Mid-Atlantic, and Northeastern United States.

Reference(s):

- Midwest Invasive Plant Network (2015). Midwest Invasive Plant List.
 - US Forest Service (0). Weed of the week_ *Euonymus alatus*.
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6. Is the species (or cultivar or variety) found predominately in a climate matching the region of concern?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Euonymus fortunei is widespread and will grow in many climates.

Reference(s):

- GBIF (0). *Euonymus fortunei* (Turcz.) Hand.-Mazz. (gbif).
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Impact on Native Plants and Animals (Questions 7 - 10)

7. Does this plant displace native plants and dominate (overtop or smother) the plant community in areas where it has established?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

"Due to wintercreeper's aggressiveness, it can form a dense ground cover that reduces or eliminates native groundcover species in woodlands and forests. As it outcompetes native plants for space and sunlight, it also hinders them by depleting nutrients and moisture in the soil. The dense ground cover can also restrict tree seedling establishment. Climbing wintercreeper can smother and kill shrubs and small trees." In gardens and managed landscapes, weed suppression is a desirable trait of this groundcover (Shannon McEnerney).

Reference(s):

- Missouri Department of Conservation (2011). Wintercreeper Invasive Species Fact Sheet.
 - CABI (0). *Euonymus fortunei* (wintercreeper)_CABI.
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8. Is the plant noted as promoting fire and/or changing fire regimes?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

"In North America, wintercreeper typically occurs in forests where presettlement fire regimes probably varied...Once established, wintercreeper is likely to survive and persist under any of these fire regimes...Wintercreeper may alter fuel properties in invaded areas; however, no data are available on this topic."

Reference(s):

- Zouhar, K.. (2009). *Euonymus fortunei* (fs.fed).



9. Is the plant a health risk to humans or animals/fish? Has the species been noted as impacting grazing systems?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeners* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

Toxic if large quantities are ingested, but that does not seem to occur frequently.

Reference(s):

- [Anonymous] .
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10. Does the plant produce impenetrable thickets, blocking or slowing movement of animals, livestock, or humans?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeners* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

There are no reports of impenetrable thickets in the literature. *Euonymus fortunei* is primarily a low-growing groundcover. Adult forms may grow upright to 3 feet. It climbs trees or other structures but tends to cling fairly closely. Scrambling over an existing thicket would block movement.

Reference(s):

- Zouhar, K.. (2009). *Euonymus fortunei* (fs.fed).
 - NESOM, GUYL. (2010). First report of *Euonymus fortunei* (Celastraceae) naturalized in Texas. *Phytoneuron*. 1, 1–4.
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Reproductive Strategies (Questions 11 - 17)

11. Does this species (or cultivar or variety) reproduce and spread vegetatively?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

"Wintercreeper regenerates sexually by producing fruits that are readily dispersed by birds, and vegetatively through long branches and lateral shoots that root at the nodes and form independent plants"
"Plants can reproduce vegetatively, forming rootlets at nodes where branches contact the ground"

Reference(s):

- Zouhar, K.. (2009). *Euonymus fortunei* (fs.fed).
 - CABI (0). *Euonymus fortunei* (wintercreeper)_CABI.
-

12. If naturally detached fragments from this plant are capable of producing new plants, is this a common method of reproduction for the plant?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

"Climbing euonymus also escapes from neglected gardens and is carried by water, to undisturbed forest and riparian areas...All plant parts including stem fragments and mature fruits should be bagged and disposed of in a trash dumpster to prevent reestablishment."

Reference(s):

- Remaley, T. (2009). PCA Alien Plant Working Group - Climbing *Euonymus* (*Euonymus fortunei*).
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13. Does the species (or cultivar or variety) commonly produce viable seed?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Euonymus fortunei must grow upright with stems >1cm in diameter to achieve its "adult form" which produces seeds. In some locations, plants may stay in juvenile form as a groundcover and never produce seed, particularly in managed landscapes. However, it is not uncommon for this species to produce viable seed: "Wintercreeper regenerates sexually by producing fruits that are readily dispersed by birds"

Reference(s):

- Remaley, T. (2009). PCA Alien Plant Working Group - Climbing *Euonymus* (*Euonymus fortunei*).
 - Missouri Department of Conservation (2011). Wintercreeper Invasive Species Fact Sheet.
 - Zouhar, K.. (2009). *Euonymus fortunei* (fs.fed).
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14. Does this plant produce copious viable seeds each year (> 1000)?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

There are no descriptions of copious seed production in the literature. "Each dry capsule holds up to 4 seeds covered in a bright orange aril"

Reference(s):

- CABI (0). *Euonymus fortunei* (wintercreeper)_CABI.
-



15. Is there significant germination (>25%) of seeds the next growing season, with no requirement of an infrequent environmental condition for seeds to germinate (i.e. fire) or long dormancy period?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

Dirr recommends: "moist stratification at 41 degrees F for 3 months...germination is more uniform if arils are removed."

Reference(s):

- Dirr, M. A. (1998). Manual of Woody Landscape Plants: Their Identification, Ornamental Characteristics, Culture, Propagation and Uses.
-

16. Does this plant produce viable seed within the first three years (for an herbaceous species) to five years (for a woody species) after germination?

Answer / Justification:

Euonymus fortunei must grow upright with stems >1cm in diameter to achieve its "adult form" which produces seeds. It is noted as a vigorous grower, but there are no estimates in the literature of how quickly it can produce seed after germination.

Reference(s):

- Zouhar, K.. (2009). *Euonymus fortunei* (fs.fed).
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17. Does this plant continuously produce seed for >3 months each year or does seed production occur more than once a year?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

In Missouri: "The flowers occur in clusters, with a long flower stalk, and develop from May to July....Fruits mature from September to November." In warmer climates, the flowering period may be extended.

Reference(s):

- Missouri Department of Conservation (2011). Wintercreeper Invasive Species Fact Sheet.
-

Dispersal (Questions 18 - 20)

18. Are the plant's propagules frequently dispersed long distance (>100 m) by mammals or birds or via domestic animals?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

"Wintercreeper seeds are equipped with arils that are readily eaten by birds and other wildlife, which then disperse the seed, possibly many miles away" "Birds, small mammals and water also disperse wintercreeper seeds."

Reference(s):

- Missouri Department of Conservation (2011). Wintercreeper Invasive Species Fact Sheet.
 - Zouhar, K.. (2009). *Euonymus fortunei* (fs.fed).
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19. Are the plant's propagules frequently dispersed long distance (>100 m) by wind or water?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

"Birds, small mammals and water also disperse wintercreeper seeds." "Climbing euonymus also escapes from neglected gardens and is carried by water, to undisturbed forest and riparian areas."

Reference(s):

- Remaley, T. (2009). PCA Alien Plant Working Group - Climbing Euonymus (*Euonymus fortunei*).
 - Missouri Department of Conservation (2011). Wintercreeper Invasive Species Fact Sheet.
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20. Are the plant's propagules frequently dispersed via contaminated seed (agriculture or wildflower packets), equipment, vehicles, boats or clothing/shoes?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeners* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

There is no evidence of accidental dispersal by humans.

Reference(s):

- [Anonymous] .
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Total PRE Score

PRE Score: 16 -- Reject (high risk of invasiveness)

Confidence: 79 / 100

Questions answered: 19 of 20 -- Valid (80% or more questions answered)

PRE Score Legend

The PRE Score is calculated by adding the point totals for each (answered) question.

< 13 : accept (low risk of invasiveness)

13 - 15 : evaluate further

> 15 : reject (high risk of invasiveness)

Questions Answered Legend

It is important to answer at least 16 questions to consider a PRE Score as "valid".

≥ 16 : valid (80% or more questions answered)

≤ 15 : invalid (not enough questions answered)

Organization Ownership and Content Privacy

Organization: 2017 Farm Bill PRE Project

Content Privacy: Public



Evaluation Reviewers

The PRE approach is to base decisions on science and make decisions by consensus of diverse horticultural stakeholders. The literature review and process of answering PRE's questions are based on science; the decisions of which plants to prioritize are based on consensus. To ensure this process is in place and that PRE is collaborative, volunteer stakeholders are recruited from each region to review evaluations. The following experts in their profession (plant science, conservation, or horticultural trade) have participated as volunteer PRE reviewers for this evaluation:

- Shannon McEnerney

December 21, 2017

This evaluation has a total of 1 reviewer(s).



Evaluation Issues

The following section lists all public issues for this evaluation. Issues provide a way for stakeholder reviewers to communicate any concerns or suggestions they might have with the plant or evaluation. Please email PlantRight@suscon.org if additional action is required to resolve open issues.

Issue ID # 6196

Date Created: December 21, 2017 - 1:34pm

Date Updated: January 29, 2018 - 7:14am

Submitted by: Shannon McEnerney

Status: Fixed

Type: Comment

Severity: Minor

Scope: Q13. Does the species (or cultivar or variety) commonly produce viable seed?

Issue Description

Used as a groundcover in a managed landscape, *Euonymus* (specifically *E. fortunei* var. *Coloratus*) is generally pruned and not allowed to grow vertically and achieve maturity, thus not allowing it to produce seed.

Issue Resolution (Screener's Response to Issue)

Added "particularly in managed landscapes" to the answer for this question (referring to the likelihood of staying in juvenile form).

Issue ID # 6195

Date Created: December 21, 2017 - 1:30pm

Date Updated: January 29, 2018 - 7:19am

Submitted by: Shannon McEnerney



Status: Fixed

Type: Comment

Severity: Minor

Scope: Q07. Does this plant displace native plants and dominate the plant community in areas where it has been established?

Issue Description

When used as a horticultural groundcover in a landscape setting, Wintercreepers ability to form a dense ground cover is a desirable trait in order to reduce soil erosion and supress weeds.

Issue Resolution (Screener's Response to Issue)

Added to the answer: "In gardens and managed landscapes, weed suppression is a desirable trait of this groundcover."



About PRE and this Plant Evaluation Report

The PlantRight Plant Risk Evaluator -- PRE is an online database and platform enabling those involved in non-native, terrestrial plant production to know before they grow if a plant poses a regional invasive risk. This tool offers many benefits, and we encourage you to visit the PRE website (<https://pre.ice.ucdavis.edu>) for more information.

If you are a nursery trade association, or involved in the research, development or distribution of horticultural plants we invite you to join the PRE community. If you are a plant scientist, affiliated with a horticultural college or botanic garden, and would like to learn more about becoming a PRE Screener, please drop us an email, PlantRight@suscon.org, requesting a PRE Account.

PRE beta funding is provided by Sustainable Conservation (<http://www.suscon.org/>) and a USDA Farm Bill grant.