



***Plant Risk Evaluator -- PRE™  
Evaluation Report***

***Celastrus orbiculatus -- Minnesota***

***2017 Farm Bill PRE Project***

**PRE Score:** 19 -- Reject (high risk of invasiveness)

**Confidence:** 85 / 100

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

**Privacy:** Public

**Status:** Completed

**Evaluation Date:** September 22, 2017

*This PDF was created on June 15, 2018*



## Plant Evaluated

*Celastrus orbiculatus*



Image by Chris Evans



## Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Celastrus orbiculatus*) 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

Oriental bittersweet poses a significant threat to native plant communities. It grows rapidly and can shade out the vegetation that supports it. It girdles trees and trunks, cutting off the flow of water and nutrients. Weakened trees, burdened with the weight of massive woody vines and leaves can break off. Oriental bittersweet typically produces abundant flowers, fruits, and seed. The seeds are often spread by birds. Seed is also dispersed by humans who collect the vines for ornamental (wreaths, etc.) purposes.

## General Information

**Status:** Completed

**Screener:** Dan Miller

**Evaluation Date:** September 22, 2017

## Plant Information

**Plant:** *Celastrus orbiculatus*

## Regional Information

**Region Name:** Minnesota



## **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:

*Celastrus orbiculatus* has naturalized throughout the northeastern and Midwestern states.

#### Reference(s):

- Forest Invasive Plants Resource Center (0). Oriental bittersweet\_Forest service.
  - United States Department of Agriculture (0). Plants Profile for *Celastrus orbiculatus* (Oriental bittersweet).
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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:

Oriental bittersweet is naturalized in many areas of Wisconsin



**Reference(s):**

- Wisconsin Department of Natural Resources (2013). Oriental Bittersweet - Wisconsin Invasive Species.
  - United States Department of Agriculture (0). Plants Profile for *Celastrus orbiculatus* (Oriental bittersweet).
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**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:**

This plant is on the Prohibited Noxious Weed Eradicate List of Minnesota.

**Reference(s):**

- Minnesota Department of Agriculture (2017). Minnesota 2017 Noxious Weed List.
  - United States Department of Agriculture (0). Plants Profile for *Celastrus orbiculatus* (Oriental bittersweet).
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**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:**

This plant is listed as invasive in Wisconsin



**Reference(s):**

- Wisconsin Department of Natural Resources (2013). Oriental Bittersweet - Wisconsin Invasive Species.
  - United States Department of Agriculture (0). Plants Profile for *Celastrus orbiculatus* (Oriental bittersweet).
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**5. Are other species of the same genus (or closely related genera) invasive in a similar climate?**

- 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 references of other *Celastrus* species that are invasive in a similar climate

**Reference(s):**

- [Anonymous] .
- 

**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 *screeener* has a **High** confidence in this answer based on the available literature.

**Answer / Justification:**

*Celastrus orbiculatus* can be found as far south as South Carolina and Georgia

**Reference(s):**

- Forest Invasive Plants Resource Center (0). Oriental bittersweet\_Forest service.
- GBIF (2017). *Celastrus orbiculatus* C.P. Thunberg ex A. Murray.



## 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:

As a fast growing, twining vine, *C. orbiculatus* is a threat to other plants through constriction of the woody stems it climbs upon leading to slowed growth and eventually mechanical failure, over-topping and shading out plants beneath it.

#### Reference(s):

- CABI (0). *Celastrus orbiculatus* (Asiatic bittersweet)\_CABI.
  - Fryer, J. L. (2011). *Celastrus orbiculatus*.
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### 8. Is the plant noted as promoting fire and/or changing fire regimes?

- 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:

Oriental bittersweet may act as a ladder fuel by growing up and over supporting shrubs and trees, which increases the chance that a fire will crown.

#### Reference(s):

- Forest Invasive Plants Resource Center (0). Oriental bittersweet\_Forest service.
  - Fryer, J. L. (2011). *Celastrus orbiculatus*.
-



**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 **High** confidence in this answer based on the available literature.

**Answer / Justification:**

There is no information in the literature that this plant is a health risk to animals and fish.

**Reference(s):**

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

- 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:**

Vines can become intertwined and form impenetrable thickets.

**Reference(s):**

- Forest Invasive Plants Resource Center (0). Oriental bittersweet\_Forest service.
  - Fryer, J. L. (2011). *Celastrus orbiculatus*.
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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:

Asexual regeneration is important for Oriental bittersweet spread. Oriental bittersweet sprouts from roots, root fragments, and the root crown

#### Reference(s):

- Forest Invasive Plants Resource Center (0). Oriental bittersweet\_Forest service.
  - CABI (2017). *Celastrus orbiculatus* (Asiatic bittersweet).
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### 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: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

#### Answer / Justification:

Seed is the most common method of reproduction.

#### Reference(s):

- Forest Invasive Plants Resource Center (0). Oriental bittersweet\_Forest service.
-



### 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 **Very High** confidence in this answer based on the available literature.

#### Answer / Justification:

Overall germination rate of Oriental bittersweet is high, showing 85% to 95% germination in the laboratory.

#### Reference(s):

- Forest Invasive Plants Resource Center (0). Oriental bittersweet\_Forest service.
  - CABI (2017). *Celastrus orbiculatus* (Asiatic bittersweet).
- 

### 14. Does this plant produce copious viable seeds each year (> 1000)?

- 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:

Oriental bittersweet typically produces abundant flowers, fruits, and seeds. Individual vines can reach up to 66 feet in length.

#### Reference(s):

- Forest Invasive Plants Resource Center (0). Oriental bittersweet\_Forest service.
  - National Park Service (2009). PCA Fact Sheet - Oriental Bittersweet (*Celastrus orbiculatus*).
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**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 *screeners* has a **Very High** confidence in this answer based on the available literature.

**Answer / Justification:**

Most seed germinates within one year. Because so much of the seed germinates immediately, there is only a short-lived seed bank.

**Reference(s):**

- Michigan State University Extension (0). Oriental bittersweet: An aggressive, invasive plant.
  - Howard, J. L. (2005). Species: *Celastrus orbiculatus* - *Celastrusorbiculatus.pdf*.
- 

**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: **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:**

Plants mature quickly and both male and female plants can produce flowers at two years of age

**Reference(s):**

- Michigan State University Extension (0). Oriental bittersweet: An aggressive, invasive plant.
  - Howard, J. L. (2005). Species: *Celastrus orbiculatus* - *Celastrusorbiculatus.pdf*.
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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 **Medium** confidence in this answer based on the available literature.

**Answer / Justification:**

There is no information in the literature that Oriental bittersweet produces flowers and seed for >3 months each year

**Reference(s):**

- [Anonymous] .
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**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 **Very High** confidence in this answer based on the available literature.

**Answer / Justification:**

A number of birds, including black-capped chickadees, European starlings, blue jays, yellow-rumped warblers, American robins, other thrushes, and catbirds feed on *Celastrus orbiculatus*.

**Reference(s):**

- CABI (2017). *Celastrus orbiculatus* (Asiatic bittersweet).
  - National Park Service (2009). PCA Fact Sheet - Oriental Bittersweet (*Celastrus orbiculatus*).
  - Howard, J. L. (2005). Species: *Celastrus orbiculatus* - *Celastrusorbiculatus.pdf*.
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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 **Low** confidence in this answer based on the available literature.

**Answer / Justification:**

The fruits can float if they fall into water; however, this may not be a frequent method of dispersal

**Reference(s):**

- Forest Invasive Plants Resource Center (0). Oriental bittersweet\_Forest service.
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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: **Yes**, which contributes **1** points to the total PRE score.
- The *screeners* has a **Medium** confidence in this answer based on the available literature.

**Answer / Justification:**

Humans using fruiting branches for ornaments (wreaths, etc.) may disperse seed seeds when collecting or disposing of the branches

**Reference(s):**

- CABI (0). *Celastrus orbiculatus* (Asiatic bittersweet)\_CABI.
  - Howard, J. L. (2005). Species: *Celastrus orbiculatus* - *Celastrusorbiculatus.pdf*.
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## Total PRE Score

**PRE Score:** 19 -- Reject (high risk of invasiveness)

**Confidence:** 85 / 100

**Questions answered:** 20 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".

$\geq 16$  : valid (80% or more questions answered)

$\leq 15$  : invalid (not enough questions answered)

## Organization Ownership and Content Privacy

**Organization:** 2017 Farm Bill PRE Project

**Content Privacy:** Public





## 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](mailto:PlantRight@suscon.org) if additional action is required to resolve open issues.

### Issue ID # 5930

**Date Created:** November 22, 2017 - 9:00am

**Date Updated:** December 15, 2017 - 10:55am

**Submitted by:** Laura Van Riper

**Status:** Fixed

**Type:** Suggestion

**Severity:** Minor

**Scope:** Q05. Are other species of the same genus invasive in a similar climate?

### Issue Description

Typo: Should be "Celastrus species", not "Orbiculatus species"

### Issue Resolution (Screener's Response to Issue)

Issue resolved by PRE Data Manager -- typo fixed.

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## **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](mailto: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.