Plant Risk Evaluator -- PRE™
Evaluation Report

Viburnum opulus L. -- Minnesota

2017 Farm Bill PRE Project

PRE Score: 15 -- Evaluate this plant further
Confidence: 78 / 100
Questions answered: 20 of 20 -- Valid (80% or more questions answered)

Privacy: Public
Status: Submitted

Evaluation Date: March 23, 2017

This PDF was created on June 15, 2018

Plant Evaluated

Viburnum opulus L.

Image by images.bugwood.org

Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Viburnum opulus L.*) 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.

General Information

Status: Submitted
Screener: Dan Miller
Evaluation Date: March 23, 2017

Plant Information

Plant: *Viburnum opulus L.*

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

Answer / Justification:

Beginning about 1960, Viburnum opulus started appearing spontaneously in native habitats in southern Minnesota, apparently spread by birds that feed on fruits. It has now become naturalized in woodlands, forest margins, stream banks, and brushy habitats.

Reference(s):

- Smith, W. R. (2008). Trees and Shrubs of Minnesota.

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

Answer / Justification:

According to the USDA Plants Database map, it is also naturalized in Wisconsin, North Dakota, and South Dakota.

Reference(s):

- Swearingen, J.., & Bargerin C.. (2016). Invasive Plant Atlas - cranberry viburnum, European highbush cranberry.
- Wisconsin Department of Natural Resources (2010). Early Detection Wetland Invasive Plants in Wisconsin.
- United States Department of Agriculture (0). Plants Database - Viburnum opulus L. var. opulus.

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

Answer / Justification:

USDA Plant Database map shows it naturalized throughout the east coast, south to Tennessee, north to Ontario, and also Montana and Washington in the west.

Reference(s):

- United States Department of Agriculture (0). Plants Database - Viburnum opulus L. var. opulus.

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

Answer / Justification:

According to Wisconsin Invasive Plants List and EDDMaps, it is also invasive in Wisconsin

Reference(s):

- Wisconsin Department of Natural Resources (2010). Early Detection Wetland Invasive Plants in Wisconsin.
- Swearingen, J.., & Bargerin C.. (2016). Invasive Plant Atlas - cranberry viburnum, European highbush cranberry.

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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:

Viburnum lantana is reported invasive in Wisconsin

Reference(s):

- United States Department of Agriculture (2006). Weed of the Week - Wayfaring-Tree.

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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:

Viburnum opulus is hardy to zone 8 and is naturalized as far south as Tennessee

Reference(s):

- United States Department of Agriculture (0). Plants Database - Viburnum opulus L. var. opulus.

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

Answer / Justification:

This plant will take over another plant's area and is able to spread out for more sunlight

Reference(s):

- United States Department of Agriculture (2005). Weed of the Week - Guelder Rose.

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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 *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

There are no references of this plant promoting fire

Reference(s):

- [Anonymous] .

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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 *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

There are no references indicating that this plant is a health risk to humans, animals, or 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: **No**, which contributes **0** points to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

Although Viburnum opulus can displace native vegetation, there is no mention of the species producing impenetrable thickets

Reference(s):

- [Anonymous] .

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

Answer / Justification:

It frequently forms adventitious roots and new vertical shoots on branches close to the ground.

Reference(s):

- Kollmann, J., & Grubb P. J. (2002). Liburnum lantana L. and Viburnum opulus L. (V. lobatum Lam., Opulus vulgaris Borkh.). JOURNAL OF ECOLOGY (British Ecological Society). 90(6), 1044-1070.

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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 *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

Although this plant will produce adventitious roots and shoots on branches close to the ground, there is no reference indicating that naturally detached fragments are capable of producing new plants

Reference(s):

- [Anonymous] .

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

Answer / Justification:

see section (D) Viability of Seed: Germination (p. 1061) of attached Kollmann and Grubb paper

Reference(s):

- Kollmann, J., & Grubb P. J. (2002). Liburnum lantana L. and Viburnum opulus L. (V. lobatum Lam., Opulus vulgaris Borkh.). JOURNAL OF ECOLOGY (British Ecological Society). 90(6), 1044-1070.

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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 *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

The paper by Conklin and Sellmer show that the species V. opulus did not produce high amounts of seed but they were highly viable. This study also evaluated the cultivars "Aureum", "Compactum", "Leonard's Dwarf", Loosely's Compact", "Nanum", "Roseum", and"Xanthocarpum".

Reference(s):

- Conklin, J. R., & Sellmer J. C. (2009). Flowering, Fecundity, Seed Germination, and Seed Viability of Viburnum opulus L. Cultivars. Journal of Environmental Horticulture. 27(1), 31-36.

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

Answer / Justification:

Germination of Viburnum opulus occurs mostly in the first spring after fruiting with few additional seedlings in the second spring.

Reference(s):

- Kollmann, J., & Grubb P. J. (2002). Liburnum lantana L. and Viburnum opulus L. (V. lobatum Lam., Opulus vulgaris Borkh.). JOURNAL OF ECOLOGY (British Ecological Society). 90(6), 1044-1070.

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

Answer / Justification:

Viburnum opulus flowers when plants are 3 to 5 years old.

Reference(s):

- Conklin, J. R., & Sellmer J. C. (2009). Flowering, Fecundity, Seed Germination, and Seed Viability of Viburnum opulus L. Cultivars. Journal of Environmental Horticulture. 27(1), 31-36.

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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 *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

References indicate that flower production is in early summer and does not last >3 months

Reference(s):

- Wikipedia (2018). Viburnum opulus.

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 *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

Seed is spread by birds so distances are > 100m.

Reference(s):

- Jones, E.., & Wheelwright N.. (1987). Seasonal changes in the fruits of Viburnum opulus, a fleshy-fruited temperate zone shrub. Canadian Journal of Botony. 65, 2291-2296.

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19. Are the plant’s propagules frequently dispersed long distance (>100 m) by wind or water?

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

Answer / Justification:

There is no evidence in the literature that the plant's propagules are dispersed by wind or water.

Reference(s):

- [Anonymous] .

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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 *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

There are no indications in the literature that the plant's propagules are spread by humans.

Reference(s):

- [Anonymous] .

Total PRE Score

PRE Score: 15 -- Evaluate this plant further
Confidence: 78 / 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".
>= 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:

• Laura Van Riper	November 22, 2017
• Tom Buechel	November 9, 2017

This evaluation has a total of 2 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 # 5934

Date Created: November 22, 2017 - 9:07am
Date Updated: December 15, 2017 - 10:50am

Submitted by: Laura Van Riper

Status: Fixed
Type: Suggestion
Severity: Minor
Scope: Q18. Are the plant’s propagules dispersed long distance (>100 m) by mammals or birds or via domestic animals?

Issue Description
Minor typo: Should be "fleshy" not "flehy":

Reference(s):

Jones, E.., & Wheelwright N.. (1987). Seasonal changes in the fruits of Viburnum opulus, a flehy-fruited temperate zone shrub. Canadian Journal of Botony. 65, 2291-2296.

Issue Resolution (Screener's Response to Issue)

Issue resolved by PRE Data Manager -- typo resolved on source page.

Issue ID # 3389

Date Created: June 7, 2017 - 7:03am
Date Updated: June 7, 2017 - 7:03am

Submitted by: Tim Vogel

Status: Not Fixed
Type:
Severity: Major
Scope: Q15. 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?

Issue Description

From the Seeds of Woody Plants in the United States, USDA Forest Service ,1974 P 846 " Seeds of the more northern forms (of viburnums) need warm stratification for developement of the radicle followed by cold stratification to break dormancy in the epicotyl" "For this reason seeds of northern species seldom germinate naturally until the second spring after ripening"

Issue Resolution
No resolution has been entered for this issue.

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.