Plant Risk Evaluator -- PRE™
Evaluation Report

Sorbus alnifolia -- Minnesota

2017 Farm Bill PRE Project

PRE Score: 4 -- Accept (low risk of invasiveness)
Confidence: 80 / 100
Questions answered: 19 of 20 -- Valid (80% or more questions answered)

Privacy: Public
Status: Completed

Evaluation Date: July 19, 2017

This PDF was created on June 15, 2018

Plant Evaluated

Sorbus alnifolia

Image by Sten Porse

Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Sorbus alnifolia*) 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

Sorbus alnifolia is often noted as a desirable landscape plant and specified as not invasive or of low invasive potential. Negative aspects of the tree are associated with its somewhat narrow crotch angles and its susceptibility to disease. It is a direct relative to S. aucuparia, which is noted as invasive. S. alnifolia could cross pollinate with S. aucuparia resulting in a hybrid with unknown invasive potential. Also, since grafting is a common method of propagation, the rootstock may have the potential to sprout if the top were damaged or removed.

General Information

Status: Completed
Screener: Mike Monterusso
Evaluation Date: July 19, 2017

Plant Information

Plant: *Sorbus alnifolia*

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:

According to GBIF.org, Sorbus alnifolia has naturalized in the US, Canada, and Europe.

Reference(s):

- GBIF (2007). Occurrence Search Results.

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

Answer / Justification:

No evidence found.

Reference(s):

- [Anonymous] .

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

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

Answer / Justification:

No evidence found.

Reference(s):

- [Anonymous] .

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

Answer / Justification:

No evidence found.

Reference(s):

- [Anonymous] .

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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:

Sorbus aucuparia is invasive in Minnesota and Wisconsin.

Reference(s):

- Invasive Plant Atlas of the United States (2016). European mountain-ash: Sorbus aucuparia (Rosales: Rosaceae): Invasive Plant Atlas of the United States.

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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:

According to GBIF, Sorbus alnifolia is found predominately in SE Asia and Japan.

Reference(s):

- GBIF (2007). Occurrence Search Results.

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

Answer / Justification:

No evidence found.

Reference(s):

- [Anonymous] .

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

Answer / Justification:

No evidence found.

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

Answer / Justification:

No evidence found.

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

Answer / Justification:

No evidence found.

Reference(s):

- [Anonymous] .

Reproductive Strategies (Questions 11 - 17)

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

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

Answer / Justification:

No evidence found.

Reference(s):

- [Anonymous] .

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

Answer / Justification:

No evidence found.

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:

"Propagation is by seed, with difficulty, or by grafting"

Reference(s):

- Gilman, E. F., & Watson D. G. (1994). Sorbus alnifolia Figure - Mature Korean Mountain-Ash. Korean Mountain-Ash.

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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:

No studies of S. alnifolia regarding quantity of seed produced could be found. However, review of mature tree photos shows that S. alnifolia could produce >1,000 seeds/plant, but does not produce as much seed as S. aucuparia, which is a related species noted as being invasive. One website suggests S. alnifolia germination rate is 50-70%, implying that the overall germination number is likely less than 1,000/plant.

Reference(s):

- F. W. Schumacher Co., Inc. (2017). Sorbus alnifolia (Korean Mountain Ash) Seed Description.

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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: **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:

One commercial seed source suggests a germination rate of 50-70%. However, impartial sources suggest that the germination rate is actually closer to 25%, or can be germinated "with some difficulty".

Reference(s):

- F. W. Schumacher Co., Inc. (2017). Sorbus alnifolia (Korean Mountain Ash) Seed Description.
- Gilman, E. F., & Watson D. G. (1994). Sorbus alnifolia Figure - Mature Korean Mountain-Ash. Korean Mountain-Ash.
- Choi, C-H., Seo B-S., & Park W-J. (2009). Effect of Priming Treatments on Seed Germination and Seedling Growth of Sorbus alnifolia.

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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 / Justification:

No evidence of maturity time from seed could be found.

Reference(s):

- [Anonymous] .

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

Answer / Justification:

The tree flowers and sets seed once/year in late spring.

Reference(s):

- The Morton Arboretum (2017). Korean mountain-ash - The Morton Arboretum.

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

Answer / Justification:

S. alnifolia fruits are frequently consumed by birds.

Reference(s):

- Gilman, E. F., & Watson D. G. (2015). ENH-756/ST598: Sorbus alnifolia: Korean Mountain Ash.

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

Answer / Justification:

No evidence found.

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

Answer / Justification:

No evidence found.

Reference(s):

- [Anonymous] .

Total PRE Score

PRE Score: 4 -- Accept (low risk of invasiveness)
Confidence: 80 / 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:

• Chel Anderson	December 27, 2017
• Laura Van Riper	December 18, 2017
• Tom Buechel	November 10, 2017

This evaluation has a total of 3 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 # 5970

Date Created: November 27, 2017 - 10:39am
Date Updated: November 30, 2017 - 8:02am

Submitted by: Laura Van Riper

Status: Fixed
Type: Suggestion
Severity: Minor
Scope: Q20. Are the plant’s propagules frequently dispersed via contaminated seed, equipment, vehicles, boats or clothing/shoes?

Issue Description

This didn't make sense. The answer was a highly confident yes, but the comment was "no evidence found".

Yes or No: Yes

Points: 1

Confidence Level:High

Answer / Justification:No evidence found.

Issue Resolution (Screener's Response to Issue)

"Yes" response was an error. Answer changed to "no".

Issue ID # 5969

Date Created: November 27, 2017 - 10:37am
Date Updated: November 30, 2017 - 8:07am

Submitted by: Laura Van Riper

Status: Fixed
Type: Suggestion
Severity: Minor
Scope: Q16. Does this plant produce viable seed within the first three years (for an herbaceous species) to five years (for a woody species) after germination?

Issue Description

The comments say that no data on how long it takes to reach maturity could be found. The question should then be left unanswered.

Issue Resolution (Screener's Response to Issue)

Answer removed.

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.