Plant Risk Evaluator -- PRE™
Evaluation Report

Elaeagnus angustifolia -- Minnesota

2017 Farm Bill PRE Project

PRE Score: 15 -- Evaluate this plant further
Confidence: 79 / 100
Questions answered: 18 of 20 -- Valid (80% or more questions answered)

Privacy: Public
Status: Submitted

Evaluation Date: August 29, 2017

This PDF was created on June 15, 2018

Plant Evaluated

Elaeagnus angustifolia

Image by MBOT

Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Elaeagnus angustifolia*) 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

While Elaeagnus angustifolia might be a bigger problem in areas outside of Minnesota, it is still present at a density sufficient to warrant the MNDNR to label the plant as a threat to the environment. It is predominately found in riparian areas, but is highly adaptive to a wide range of environmental conditions. It produces fruits that are very attractive to birds, which are the primary vector for plant dispersal. It is also relatively shade tolerant and can survive in the understory of native trees, taking over when the native canopy dies off.

General Information

Status: Submitted
Screener: Mike Monterusso
Evaluation Date: August 29, 2017

Plant Information

Plant: *Elaeagnus angustifolia*

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:

It has naturalized in numerous US states.

Reference(s):

- United States Department of Agriculture (2017). Plants Profile for Elaeagnus angustifolia (Russian olive).

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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:

Has naturalized in Wisconsin.

Reference(s):

- United States Department of Agriculture (2017). Plants Profile for Elaeagnus angustifolia (Russian olive).

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:

It is a noxious weed in Colorado, Connecticut, and New Mexico.

Reference(s):

- United States Department of Agriculture (2017). Plants Profile for Elaeagnus angustifolia (Russian olive).
- Zouhar, K. (2005). Species: Elaeagnus angustifolia.

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:

It is restricted in Wisconsin.

Reference(s):

- Wisconsin Department of Natural Resources (2013). Russian olive - Wisconsin DNR.
- United States Department of Agriculture (2017). Plants Profile for Elaeagnus angustifolia (Russian olive).

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:

Elaeagnus umbellata is invasive in multiple US states.

Reference(s):

- United States Department of Agriculture (2017). Invasive Species: Plants - Autumn Olive (Elaeagnus umbellata).
- United States Department of Agriculture (2017). Plants Profile for Elaeagnus umbellata (autumn olive).

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

Answer / Justification:

According to GBIF, most occurrences of Elaeagnus angustolia are in Europe and the central part of the US.

Reference(s):

- [Anonymous] .

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

Answer / Justification:

"Russian olive quickly takes over streambanks, lake shores and prairies, choking out native vegetation of riparian habitat. It tolerates shade and a variety of soil moisture conditions. It interferes with nutrient cycling and taxes water reserves."

Reference(s):

- Minnesota Department of Natural Resources (2017). Russian olive - Invasive species: Minnesota DNR.
- Zouhar, K. (2005). Species: Elaeagnus angustifolia.

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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:

"Information on fire regimes in which Russian-olive evolved is lacking. Similarly, there is little quantitative information on prehistoric frequency, seasonality, severity and spatial extent of fire in North American riparian ecosystems, where Russian-olive is commonly invasive. "

Reference(s):

- Zouhar, K. (2005). Species: Elaeagnus angustifolia.

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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:

"...its fruits, which seldom ripen..., are relished by birds which disperse the seeds."

Reference(s):

- Wikipedia (2017). Elaeagnus angustifolia.

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

Answer / Justification:

"When grown close together, it forms a dense thicket or shrub-hedge" "This deciduous woody species grows from 6 to 20 feet tall as a shrub or small tree, typically with multiple stems. Infested areas create dense thickets"

Reference(s):

- USDA Forest Service, Forest Health Staff (2017). Microsoft Word - DJE-AutumnRussianOlive-DONE.doc - autumn-and-russian-olive.pdf.

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:

"E. angustifolia can reproduce either sexually or vegetatively. Numerous root suckers are produced at the root crown after disturbance or damage to the above-ground tree from fire, cutting, or girdling. "

Reference(s):

- Tu, M., Rice B., & Randall J. M. (2016). Elaeagnus angustifolia - Bugwoodwiki.
- Zouhar, K. (2005). Species: Elaeagnus angustifolia.

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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:

While E. angustifolia can spread vegetatively, it spreads mostly by dispersal of its seeds by birds: "Seed production and dispersal enables E. angustifolia to rapidly colonize new areas"

Reference(s):

- Tu, M., Rice B., & Randall J. M. (2016). Elaeagnus angustifolia - Bugwoodwiki.
- Zouhar, K. (2005). Species: Elaeagnus angustifolia.

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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:

"Seed production and dispersal enables E. angustifolia to rapidly colonize new areas"

Reference(s):

- Tu, M., Rice B., & Randall J. M. (2016). Elaeagnus angustifolia - Bugwoodwiki.
- GBIF (2017). Elaeagnus angustifolia L..
- USDA Forest Service, Forest Health Staff (2017). Microsoft Word - DJE-AutumnRussianOlive-DONE.doc - autumn-and-russian-olive.pdf.

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

Answer / Justification:

"It is generally stated that Russian-olive produces a large amount of seed, but nothing quantitative was found in the literature."

Reference(s):

- Zouhar, K. (2005). Species: Elaeagnus angustifolia.

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

Answer / Justification:

"Under greenhouse conditions, Russian olive seed has high germination and emergence when planted at a shallow depth (1 inch or less). Of the seeds planted in the study at the 1-inch depth, 89.6 percent germinated and emerged within 30 days of planting"

Reference(s):

- Hybner, R., & Espeland E. (2014). Russian Olive Elaeagnus angustifolia L.Effect of Seed Burial Depth on Seedling Emergence and Seed Viability.

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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: **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:

Two sources mention it reaches reproductive maturity at about 10 years. One source suggests it's 3-5 years.

Reference(s):

- Collins, E. (2002). Invasion Biology Introduced Species Summary Project - Columbia University - Elaeagnus angustifolia L..
- Lesica, P., & Miles S. (2001). Natural history and invasion of Russian olive along eastern Montana rivers. Western North American Naturalist. 61, 1.
- Zouhar, K. (2005). Species: Elaeagnus angustifolia.

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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?

Reference(s):

- [Anonymous] .

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:

"Birds foraging on the Russian olive's fruit scatter seeds at a very rapid rate."

Reference(s):

- Collins, E. (2002). Invasion Biology Introduced Species Summary Project - Columbia University - Elaeagnus angustifolia L..
- Zouhar, K. (2005). Species: Elaeagnus angustifolia.

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:

No evidence found.

Reference(s):

- [Anonymous] .

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: 15 -- Evaluate this plant further
Confidence: 79 / 100
Questions answered: 18 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 # 6317

Date Created: January 22, 2018 - 6:08pm
Date Updated: January 22, 2018 - 6:08pm

Submitted by: Matthew Kaproth

Status: Not Fixed
Type: Suggestion
Severity: Minor
Scope: Q14. Does this plant produce copious viable seeds each year (>1000)?

Issue Description

Question needs to be evaluated - I believe from the size and maturity the species can get to (and personal observation), the plant can produce >1000 seeds in a year.

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.