



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

Caragana arborescens -- Minnesota

2017 Farm Bill PRE Project

PRE Score: 14 -- Evaluate this plant further

Confidence: 83 / 100

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

Privacy: Public

Status: Completed

Evaluation Date: September 12, 2017

This PDF was created on June 15, 2018



Plant Evaluated

Caragana arborescens



Image by A. Barra



Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Caragana arborescens*) 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 *C. arborescens* does produce copious amount of seed, it does not appear to spread vegetatively or be dispersed by any means other than seeds dropping locally around the plant, potentially resulting in a thicket. The plant does have spines, although there is no evidence that the spines present a significant hazard to humans or animals.

General Information

Status: Completed

Screener: Mike Monterusso

Evaluation Date: September 12, 2017

Plant Information

Plant: *Caragana arborescens*

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:

Caragana arborescens has naturalized throughout much of northern North America.

Reference(s):

- United States Department of Agriculture (2017). Plants Profile for *Caragana arborescens* (Siberian peashrub).
-

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:

It has naturalized in Wisconsin and Minnesota.



Reference(s):

- United States Department of Agriculture (2017). Plants Profile for *Caragana arborescens* (Siberian peashrub).
 - Minnesota Department of Natural Resources (2017). Siberian peashrub - Invasive species: Minnesota DNR.
 - Wisconsin Department of Natural Resources (2015). Siberian peashrub - Wisconsin DNR.
-

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

Answer / Justification:

It's a restricted plant in Wisconsin.

Reference(s):

- Wisconsin Department of Natural Resources (2015). Siberian peashrub - Wisconsin DNR.
 - GBIF (2016). *Caragana arborescens* Lam..
 - Minnesota Department of Natural Resources (2017). Siberian peashrub - Invasive species: Minnesota DNR.
-

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

Answer / Justification:

It's a restricted plant in Wisconsin.



Reference(s):

- Wisconsin Department of Natural Resources (2015). Siberian peashrub - Wisconsin DNR.
 - Invasive Plants Association of Wisconsin (2017). Potential Invaders.
-

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

Answer / Justification:

No other species found.

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

Answer / Justification:

Most occurrences are in northern Europe.

Reference(s):

- GBIF (2016). *Caragana arborescens* Lam..
-



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

Answer / Justification:

"It invades savanna and woodland edge environments where it competes with native shrubs."

Reference(s):

- Minnesota Department of Natural Resources (2017). Siberian peashrub - Invasive species: Minnesota DNR.
 - State & Private Forestry, Forest Health Protection (2004). Selected Invasive Plants of Alaska.
-

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

Answer / Justification:

No evidence found.

Reference(s):

- [Anonymous] .
-



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:

While the plant does have spines, they don't appear to present a significant injury concern.

Reference(s):

- [Anonymous] .
-

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

Answer / Justification:

"Naturally, they scattered when the pods dry sufficiently and split open, the seeds germinating freely and forming monocultural thickets around the original plant."

Reference(s):

- Nagy, T. (2017). Plant of the Week \#9: *Caragana arborescens*.
-



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

Answer / Justification:

No evidence found.

Reference(s):

- [Anonymous] .
-

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

Answer / Justification:

No evidence found.

Reference(s):

- [Anonymous] .
-

13. Does the species (or cultivar or variety) commonly produce viable seed?

- 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:

"Seed - best sown as soon as it is ripe in a cold frame. It usually germinates in 2 weeks."

Reference(s):

- Duke, J. A. (1996). *Caragana arborescens*.
 - Plants For A Future (PFAF) (2012). *Caragana arborescens* Siberian Pea Tree, Siberian peashrub PFAF Plant Database.
-

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:

"The average number of cleaned seeds per weight ranges from 28,700 to 48,500/kg (13,000 to 22,000/lb), with a purity of 97 to 100%". While this does not quantify the raw number of seeds/plant, it does provide strong evidence that the plant produces copious amounts of seed.

Reference(s):

- GBIF (2016). *Caragana arborescens* Lam..
 - Dietz, D. R., Slabaugh P. E., & Bonner F. T. (2017). *Caragana arborescens* Lam.: Siberian peashrub - wo_AgricHandbook727_321_323.pdf.
-

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:

"Germination after 25 to 41 days averaged 45 to 72%, and 55 to 100% after 60 days"

Reference(s):

- GBIF (2016). *Caragana arborescens* Lam..
-

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

Answer / Justification:

"Shrubs take about 3 to 5 years to reach commercial seed-bearing age, and good crops occur nearly every year."

Reference(s):

- GBIF (2016). *Caragana arborescens* Lam..
-

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

Answer / Justification:

"The yellow bisexual flowers appear from April to June. The fruit is a legume (pod) that measures 2.5 to 5 cm (figure 1) and contains about 6 red- dish-brown, oblong to spherical seeds 2.5 to 4.0 mm in diameter (Lindquist and Cram 1967; Ross 1931) (figures 2and 3). Fruits change in color to amber or brown as they ripen from June to July (Rehder 1940). Seed dispersal is usually completed by mid-August."



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: **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:

"*C. arborescens* is used for nesting by several songbirds. The seeds are occasionally eaten by a few songbirds. The plant is not a preferred food for browsing animals, but its fragrant flowers attract many pollen-consuming animals."

Reference(s):

- Wikipedia (2017). *Caragana arborescens*.
-

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 *screeener* has a **High** 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 *screeners* 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: 14 -- Evaluate this plant further

Confidence: 83 / 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:

- Angelique Dahlberg December 11, 2017
- Tim Vogel November 22, 2017
- Tom Buechel November 9, 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 # 6313

Date Created: January 22, 2018 - 5:25pm

Date Updated: February 12, 2018 - 11:09am

Submitted by: Matthew Kaproth

Status: Fixed

Type: Suggestion

Severity: Major

Scope: Q06. Is the species found predominately in a climate matching the region of concern?

Issue Description

The species occurs in a climate that overlaps the region of concern.

Issue Resolution (Screener's Response to Issue)

Occurring is one thing, but according to the wording of the question it must be found predominantly in the region of concern.

Issue ID # 6131

Date Created: December 11, 2017 - 8:05am

Date Updated: December 18, 2017 - 10:07am

Submitted by: Angelique Dahlberg

Status: Fixed

Type: Comment



Severity: Minor

Scope: Q04. Is the species (or cultivar or variety) noted as being invasive in the US or world in a similar climate?

Issue Description

It is also on the Invasive Plant Association of Wisconsin's Potential Invaders list: <http://www.ipaw.org/TheSolution/Education/PresentationMaterials/PotentialInvaders.aspx>

Issue Resolution (Screener's Response to Issue)

Issue resolved by PRE Data Manager -- source added to Q4.

Issue ID # 5929

Date Created: November 22, 2017 - 8:57am

Date Updated: November 28, 2017 - 12:12pm

Submitted by: Laura Van Riper

Status: Fixed

Type: Suggestion

Severity: Minor

Scope: Evaluation as a whole

Issue Description

In the introduction, this is a weird sentence:

"Interestingly, at the time of this screening, the PRE score is a 14, meaning it's one to watch, although it's listed as invasive in Minnesota and is restricted in Wisconsin. It's unknown exactly how these local states identify and classify their invasive species."

The author could reach out to Minnesota and Wisconsin and find out how they determine which species are put on invasive species lists. In the case of the Minnesota DNR's invasive species website, the species on the list have been found by DNR land managers to be invasive in areas they manage. In the case of Siberian peashrub, it is because it forms dense thickets and outcompetes native vegetation.

In the case of the Minnesota Noxious Weed List, the Minnesota Department of Agriculture is very clear on how species are added to the Noxious weed list:



<http://www.mda.state.mn.us/plants/pestmanagement/weedcontrol/mnnwac.aspx>

Wisconsin DNR also explains their process:

<http://dnr.wi.gov/topic/Invasives/species.asp?filterBy=Terrestrial&filterVal=Y> and they have literature reviews and SAG votes posted publicly: <http://dnr.wi.gov/topic/Invasives/species.asp?filterBy=Terrestrial&filterVal=Y&catVal=PlantsReg#RegSelect>

Issue Resolution (Screener's Response to Issue)

Noted; sentence removed. Note that the actually screener was not the screener indicated for this plant. It was a colleague. That said, that person's observation of the PRE score vs state designations is an indicator of the differences of approach between PRE and any given state regulating agency. In other words, the type(s) of questions and their associated point value(s) might be different from one process to another.



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.