



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

***Pinus sylvestris -- Minnesota***

***2017 Farm Bill PRE Project***

**PRE Score:** 12 -- Accept (low risk of invasiveness)

**Confidence:** 78 / 100

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

**Privacy:** Public

**Status:** Completed

**Evaluation Date:** September 15, 2017

*This PDF was created on June 15, 2018*



## Plant Evaluated

*Pinus sylvestris*



Image by Hello, I am Bruce on Flickr



## Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Pinus sylvestris*) 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

*Pinus sylvestris* does exhibit some invasive characteristics such as the production of viable seed and a tendency to displace native species and reduce diversity. On the other hand, it does not reproduce vegetatively and its dispersal mechanisms are somewhat limited. It could be a bigger problem in climates slightly warmer than Minnesota due to its relatively fast growth rate and potential for higher seed germination rate. It is currently noted as invasive in Wisconsin but not Minnesota.

## General Information

**Status:** Completed

**Screener:** Mike Monterusso

**Evaluation Date:** September 15, 2017

## Plant Information

**Plant:** *Pinus sylvestris*

## 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:

*Pinus sylvestris* has naturalized in several US states and Canadian provinces.

#### Reference(s):

- United States Department of Agriculture (2017). Plants Profile for *Pinus sylvestris* (Scots pine).
  - Skilling, D. D. (2017). *Pinus sylvestris* L.
- 

#### 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:

It has naturalized in Wisconsin and Minnesota.

#### Reference(s):

- United States Department of Agriculture (2017). Plants Profile for *Pinus sylvestris* (Scots pine).



### 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:

"It is reported invasive in HI, IA, MA, ME, NJ, NY, OH, PA, VT, and WI."

#### Reference(s):

- US Forest Service (2006). Species Common Name: Scots Pine - scots-pine.pdf.
  - Watson, E. F. Gilman, & G. D. (2015). *Pinus sylvestris*: Scotch Pine.
- 

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

#### Answer / Justification:

It is listed as invasive in Wisconsin.

#### Reference(s):

- Wisconsin Department of Natural Resources (2015). Invasive species - Wisconsin DNR.
  - Marinich, A., & Powell K. (2017). OIPC\_BMP\_ScotsPine\_FINAL\_Mar292017\_D4.pdf.
-



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

**Answer / Justification:**

According to GBIF, *Pinus sylvestris* is found predominately in Europe.

**Reference(s):**

- GBIF (2016). *Pinus sylvestris* L..
-



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

#### Answer / Justification:

"Where Scots pine has been intermixed with red or white pine at planting, the Scotch pine grows so much more aggressively during the first few years that its roots crowd out roots of the other species leaving only Scots pine."

#### Reference(s):

- US Forest Service (2006). Species Common Name: Scots Pine - scots-pine.pdf.
  - Upper Thames River Conservation Authority (2017). Invasive Non-Native Plants in the Upper Thames River Watershed.
- 

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

#### Answer / Justification:

"*P. sylvestris* is classified by Agee (1998) in the moderate-severity fire regime, which is coherent with the wide geographical distribution and environmental variation under which the species can be found. Granstrom (2001) categorizes *P. sylvestris* trees as moderately fire resistant and able to survive several low-intensity fires. Angelstam and Kuuluvainen (2004) describe *P. sylvestris* forest in boreal Europe dry sites as being park-like and adapted to frequent low-intensity fire that results in multi-aged stands, and state that the species is more tolerant to fire as it ages, due to increased bark thickness and crown base height. Old and thickbarked trees usually survive fire, although fire scars are common..."





**Reference(s):**

- Fernandes, P. M., Vega J. A., Jiménez E., & Rigolot E. (2008). Fire resistance of European pines. *Forest Ecology and Management*. 256, 246–255.
- 

**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:**

No evidence found.

**Reference(s):**

- [Anonymous] .
- 

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

**Answer / Justification:**

No evidence found.

**Reference(s):**

- [Anonymous] .
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## 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 *screeener* has a **High** confidence in this answer based on the available literature.

#### Answer / Justification:

"In nature, Scotch pine does not reproduce vegetatively."

#### Reference(s):

- Skilling, D. D. (2017). *Pinus sylvestris* L.
- 

### 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:

"In nature, Scotch pine does not reproduce vegetatively."

#### Reference(s):

- Skilling, D. D. (2017). *Pinus sylvestris* L.
- 

### 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:**

"Seeds mature and cones ripen in early October. The cones require alternating periods of dry and wet weather to open and shed few seed until early winter. Indeed, many seeds are retained on the tree until early spring. Seeds from any one tree can be sorted visually by color into those that are full and those that are empty-empty seeds are much lighter in color (often nearly white) than full ones."

**Reference(s):**

- Skilling, D. D. (2017). *Pinus sylvestris* L.
  - Sullivan, J. (1993). *Pinus sylvestris*.
- 

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

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

**Answer / Justification:**

There is some evidence that seed production could be >1,000, but the information is inconclusive...  
"Good seed crops are produced at intervals of from 3 to 6 years with light crops in most intervening years. The number of cleaned seeds per kilogram ranges from 74,500 to 244,700 (33,800 to 111,000/lb). If properly stored, the seeds remain viable for 15 years. One kilogram (2.2 lb) of average size cones produces approximately 3,300 seeds."

**Reference(s):**

- Skilling, D. D. (2017). *Pinus sylvestris* L.
- 

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



**Answer / Justification:**

One study suggests that the germination rate could be relatively low under natural conditions but can be significantly increased by harvest timing and via a controlled environment.

**Reference(s):**

- Faculty of Forestry, University of Kafkas (2003). Germination Characteristics of Autumn-Collected *Pinus sylvestris* L. Seeds.
- 

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

**Answer / Justification:**

"Individual trees in Michigan, under favorable growth conditions, begin to produce male and female flowers at from 5 to 8 years, although the average is between 10 and 15 years."

**Reference(s):**

- Skilling, D. D. (2017). *Pinus sylvestris* L.
- 

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

**Answer / Justification:**

"Flowering occurs in late May or early June. On any one tree nearly all pollen is shed and nearly all the female flowers are receptive during the same 2- or 3-day period. In any one stand most trees flower within a day or two of each other."



**Reference(s):**

- Skilling, D. D. (2017). *Pinus sylvestris* L.
- 

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

**Answer / Justification:**

Evidence suggests that seeds are frequently dispersed greater than 100 m, although no mechanism is mentioned... "At times, large quantities of seed are dispersed onto snow cover. Seed dispersal for natural restocking of cutover areas is normally limited to between 50 and 100 m (164 to 328 ft) from the parent tree. Maximum seed dispersal is much greater, however. In northern New York, the establishment of second-generation natural Scotch pine seedlings up to at least 1 km (0.6 mi) from the seed source is the rule rather than the exception".

**Reference(s):**

- Skilling, D. D. (2017). *Pinus sylvestris* L.
  - Castro, J., Gómez J. M., García D., Zamora R., & Hódar J. A. (1999). Seed Predation and Dispersal in Relict Scots Pine Forests in Southern Spain on JSTOR.
- 

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



**Answer / Justification:**

While evidence suggests that seeds are often dispersed greater than 100 m, it is assumed that this is mechanism is by birds and other animals as opposed to wind or water.

**Reference(s):**

- Skilling, D. D. (2017). *Pinus sylvestris* L.
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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 *screeners* has a **High** confidence in this answer based on the available literature.

**Answer / Justification:**

No evidence found.

**Reference(s):**

- [Anonymous] .
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**Total PRE Score**

**PRE Score:** 12 -- Accept (low risk of invasiveness)

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

### Issue ID # 6319

**Date Created:** January 22, 2018 - 7:40pm

**Date Updated:** January 24, 2018 - 11:35am

**Submitted by:** Matthew Kaproth

**Status:** Fixed

**Type:** Suggestion

**Severity:** Minor

**Scope:** Q08. Is the plant noted as promoting fire and/or changing fire regimes?

### Issue Description

Q8 needs a response. When displacing Jack pine (*Pinus banksiana*), fires may become less frequent (a negative).

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

Issue resolved by PRE Data Manager -- changed answer to yes and added source.

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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.