



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

***Populus alba -- Minnesota***

***2017 Farm Bill PRE Project***

**PRE Score:** 14 -- Evaluate this plant further

**Confidence:** 75 / 100

**Questions answered:** 19 of 20 -- Valid (80% or more questions answered)

**Privacy:** Public

**Status:** Submitted

**Evaluation Date:** September 7, 2017

*This PDF was created on June 15, 2018*



## Plant Evaluated

*Populus alba*



Image by Paul L. Redfearn, Jr.



## Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Populus alba*) 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 *Populus alba* has naturalized throughout the US, its invasiveness in natural areas is perhaps somewhat limited. The bigger issue related to the species is that it readily hybridizes with other *Populus* species, thus contributing to the loss of diversity within the genus. Some of the information specific to *P. alba* is contradictory, specifically regarding seed germination rate and altering fire regimes. There was some evidence that it has the potential to flower at an early age, but this was limited to once instance. This screener recommends revisiting this evaluation periodically (e.g. in five years).

## General Information

**Status:** Submitted

**Screener:** Mike Monterusso

**Evaluation Date:** September 7, 2017

## Plant Information

**Plant:** *Populus alba*

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

#### Answer / Justification:

*Populus alba* has naturalized in almost every US states and several Canadian provinces.

#### Reference(s):

- United States Department of Agriculture (2017). Plants Profile for *Populus alba* (white poplar).
  - Missouri Botanical Garden (2017). *Populus alba* - Plant Finder.
- 

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

#### Answer / Justification:

It has naturalized throughout the US to include Wisconsin and Minnesota.



**Reference(s):**

- Wisconsin Department of Natural Resources (2017). So, What Should I Plant? Trees, Shrubs and Vines with Wildlife Values.
  - United States Department of Agriculture (2017). Plants Profile for *Populus alba* (white poplar).
- 

**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:**

*Populus alba* is a noxious weed in Connecticut and a restricted plant in Wisconsin.

**Reference(s):**

- United States Department of Agriculture (2017). Plants Profile for *Populus alba* (white poplar).
  - Wisconsin Department of Natural Resources (2010). Regulated Terrestrial Invasive Plants in WI.
- 

**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:**

*P. alba* is listed as a general invasive plant in Wisconsin.



**Reference(s):**

- Wisconsin Department of Natural Resources (2010). Regulated Terrestrial Invasive Plants in WI.
  - Wisconsin Department of Natural Resources (2017). So, What Should I Plant? Trees, Shrubs and Vines with Wildlife Values.
  - Midwest Invasive Plant Network (2015). Midwest Invasive Plant List.
- 

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

**Answer / Justification:**

Most occurrences are in Europe.

**Reference(s):**

- GBIF (2016). *Populus alba* 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 *screeener* has a **Very High** confidence in this answer based on the available literature.

#### Answer / Justification:

"This strong competitor grows in a variety of soils, produces large seed crops, and resprouts easily in response to damage. It escaped and spread from original planting sites to out-compete native tree and shrub species and interferes with the normal progress of natural community succession."

#### Reference(s):

- USDA Forest Service, Forest Health Staff (2005). Microsoft Word - White poplar.doc - white-poplar.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: **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:**

Findings were inconclusive: "The information available on white poplar fuel characteristics describes both low flammability and increased woody fuel loads. Flammability of white poplar was reported as low in a Virginia Cooperative Extension publication... White poplar was recommended for use in firebreaks in parts of Australia because of its firm bark, dense, compact crown, and low levels of volatile oils in foliage.... However, white poplar wood is weak and prone to breakage... Twigs and limbs are dropped throughout the year... Weak wood suggests that groundlayer woody fuel loads may be high in dense white poplar stands. Fire regimes: The prevailing fire regime in white poplar's native habitats was not described in the available literature (2010). Fire regimes in white poplar's nonnative habitats are difficult to characterize. Widespread planting of white poplar in North America has made many vegetation types potential habitat for white poplar. While dense white poplar and white poplar hybrid stands could alter fire frequency or fire behavior in invaded habitats, their impact on natural fire regimes had not been studied as of 2010. "

**Reference(s):**

- Gucker, C. (2010). *Populus alba* and hybrids.
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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 *screeener* 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: **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:

"White poplar sometimes forms thickets on coastal cliffs in southeastern England" "Dense colonies or thickets from root sprouts" "...in Michigan, white poplar thickets are common in sandy soils" "in Hickman County, Kentucky, white poplar thickets developed in the initial stages of secondary succession"

### Reference(s):

- Gucker, C. (2010). *Populus alba* and hybrids.
  - Virginia Tech Dept. of Forest Resources and Environmental Conservation (2017). *Populus alba* Fact Sheet.
- 

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

### Answer / Justification:

"Vegetative regeneration and reproduction are vital to white poplar growth, spread, persistence, and recovery from injury. Clonal growth and spread most commonly occur by root sprouting but may also occur through fragmentation and layering."

### Reference(s):

- Gucker, C. (2010). *Populus alba* and hybrids.
  - Encyclopedia of Life (2017). White Poplar - *Populus alba* - Details.
-



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

### Answer / Justification:

"Studies indicate that white poplar may disperse and establish new populations from vegetative fragments, but most studies testing the regenerative capacity of white poplar involve experiments with somewhat artificial conditions (Gucker)." "...seed germination does not appear common in the U.S.; the predominant mode of reproduction is asexual root suckering. Root suckers arise from adventitious buds from the lateral root system, enabling development of a dense colony from a single tree. Fragmentation is another method of vegetative regeneration by which clonal growth occurs; these clones sprout from twig or root pieces partially buried in sand or silt" (Larson). Because naturally detached fragments from the plant is not a common method of reproduction for the plant, the question was answered no.

### Reference(s):

- Gucker, C. (2010). *Populus alba* and hybrids.
  - Larson, K. (2011). Wisconsin DNR Assessment - *Populus alba*.
  - Caudullo, G., & de Rigo D. (2016). *Populus alba* in Europe: distribution, habitat, usage and threats.
- 

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

### Answer / Justification:

This depends on the interpretation of the question. It seems that *Populus alba*, which is dioecious, does not frequently produce viable seed within its own species. However, it does very readily hybridize with native *Populus* species resulting in viable seed. "In North America, most seed production by white poplar occurs through hybridization with bigtooth aspen, quaking aspen, or European aspen. In southeastern Michigan, all white poplar clones surveyed were female. White poplar hybrids, however, were male, female, or hermaphroditic with separate staminate and pistillate catkins."



**Reference(s):**

- Gucker, C. (2010). *Populus alba* and hybrids.
  - Plants For A Future (PFAF) (2012). *Populus alba* White Poplar 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 *screeners* has a **High** confidence in this answer based on the available literature.

**Answer / Justification:**

"Mature white poplar trees produce thousands of wind-dispersed seeds that may be carried long distances."

**Reference(s):**

- National Park Service (2009). PCA Fact Sheet - White Poplar (*Populus alba*).
  - CABI (2008). *Populus alba* (silver-leaf poplar).
- 

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



**Answer / Justification:**

Because *P. alba* readily hybridizes with other *Populus* spp., the information available regarding seed germination rate is in the context of hybrids: "Germination of white poplar hybrid seeds can be high. When white poplar and *P. alba* × *P. grandidentata* were openly pollinated in a greenhouse, germination of seeds collected from white poplar averaged 34.7%, and germination of seeds collected from *P. alba* × *P. grandidentata* averaged 81.8%. All *P. alba* × *P. grandidentata*, *P. alba* × *P. alba* × *P. grandidentata*, *P. alba* × *P. grandidentata* × *P. tremula*, and *P. alba* × *P. grandidentata* × *P. alba* × *P. tremula* hybrids that were experimentally produced in Ottawa produced viable seed. Germination was best (61%) for seed produced by crosses between white poplar and bigtooth aspen. Germination of seed produced by the other crosses ranged from 21% to 40%" Contrary to another source: "... seed germination of white poplar appears to be very low in the U.S."

**Reference(s):**

- Gucker, C. (2010). *Populus alba* and hybrids.
  - National Park Service (2009). PCA Fact Sheet - White Poplar (*Populus alba*).
- 

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

**Answer / Justification:**

"Although white poplars generally become sexually mature at 5 to 7 years old, one genotype grown from seed collected along the Italian peninsula flowered at 1 year old. Subsequent clones regenerated from this genotype failed to flower in their first year without at least 6 months of root chilling treatments."

**Reference(s):**

- Gucker, C. (2010). *Populus alba* and hybrids.
- 

**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: **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:**

No evidence found.

**Reference(s):**

- [Anonymous] .
- 

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

- 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:**

"Mature white poplar trees produce thousands of wind-dispersed seeds that may be carried long distances."



**Reference(s):**

- National Park Service (2009). PCA Fact Sheet - White Poplar (*Populus alba*).
  - USDA Forest Service, Forest Health Staff (2005). Microsoft Word - White poplar.doc - white-poplar.pdf.
  - CABI (2008). *Populus alba* (silver-leaf poplar).
- 

**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 *screeener* has a **Medium** 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:** 14 -- Evaluate this plant further

**Confidence:** 75 / 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:

- Laura Van Riper November 27, 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](mailto:PlantRight@suscon.org) if additional action is required to resolve open issues.

### Issue ID # 6321

**Date Created:** January 22, 2018 - 8:15pm

**Date Updated:** January 24, 2018 - 11:55am

**Submitted by:** Matthew Kaproth

**Status:** Fixed

**Type:** Suggestion

**Severity:** Minor

**Scope:** Q12. If naturally detached fragments from this plant are capable of producing new plants, is this a common method of reproduction for the plant?

### Issue Description

Veg. reproduction possible in riverways with storms/spring-melt breaking up colonial stands and causing fragmentation. Find a citation and re-evaluate question.

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

Issue resolved by PRE Data Manager -- While naturally detached fragments from the plant is a possible means of reproduction, it is not the common method (asexual root suckering). Answer remains no, but with 2 added sources and more information.

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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.