



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

***Aegopodium podagraria 'Variegatum' --
Minnesota***

2017 Farm Bill PRE Project

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

Confidence: 82 / 100

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

Privacy: Public

Status: Completed

Evaluation Date: May 18, 2017

This PDF was created on June 15, 2018



Plant Evaluated

Aegopodium podagraria 'Variegatum'



Image by Wikimedia



Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Aegopodium podagraria 'Variegatum'*) 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

In reviewing the literature for this evaluation, it was observed that very little distinction was made between the variegated and non-variegated form. In some cases, photographs of the two were used interchangeably. Therefore, for the purposes of this evaluation, the variegated form will be considered to be the same as the parent (non-variegated) form. *Aegopodium podagraria* is repeatedly noted to be an aggressive and invasive plant. However, most references to these characteristics are within the context of cultivated garden spaces and generally not in reference to natural areas. In other words, it's something of a nuisance to gardeners, and is generally recognized as a potential invasive plant by government authorities, but has not demonstrated the ability to invade natural areas to any critical degree. That being said, its limited seed production and viability, combined with the fact that its propagules are not dispersed long distances, places this plant in the "evaluate further" category.

General Information

Status: Completed

Screener: Mike Monterusso

Evaluation Date: May 18, 2017

Plant Information

Plant: *Aegopodium podagraria 'Variegatum'*

If the plant is a cultivar, how does its behavior differs from its parent's?

Differences between the 'Variegatum' cultivar and the parent plant are minimal. Regarding general growth habit and invasive tendency, they are the same. Differences between the two are with regard to growth and vigor in shade, with the parent species reported to photosynthesize up to 50% more than the variegated type (in shade) (<http://www.nrcresearchpress.com/doi/abs/10.1139/b73-202#.WTFCBty1thE>). Additionally, the variegated type has been known to revert back to the completely green form (<https://www.nps.gov/plants/alien/fact/aepo1.htm>).



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:

While *Aegopodium podagraria* is native to Eurasia, it has naturalized to several US states and Canada.

Reference(s):

- United States Department of Agriculture (2017). Plants Profile for *Aegopodium podagraria* (bishop's goutweed).
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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 *screeener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

A. podagraria has naturalized in several US states and Canadian provinces with similar climates to Minnesota.



Reference(s):

- United States Department of Agriculture (2017). Plants Profile for *Aegopodium podagraria* (bishop's goutweed).
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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:

"Goutweed is currently known to occur in twenty-nine states in the mid-Atlantic, Northeast and Northwest... and is reported to be invasive in natural areas in Connecticut, Michigan, New Jersey, Pennsylvania, Vermont, and Wisconsin"

Reference(s):

- Center for Invasive Species and Ecosystem Health (2010). goutweed, *Aegopodium podagraria* N/A Apiales: Apiaceae.
 - National Park Service (2009). PCA Alien Plant Working Group - Goutweed (*Aegopodium podagraria*).
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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: **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:

Aegopodium podagraria is a restricted plant in Wisconsin



Reference(s):

- Wisconsin DNR (2015). Bishop's Goutweed - Wisconsin DNR.
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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 *screeener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

No information regarding other invasive *Aegopodium* species or closely related genera could be found.

Reference(s):

- United States Department of Agriculture (2017). Plants Profile for *Aegopodium podagraria* (bishop's goutweed).
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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 *screeener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

According to GBIF, *A. podagraria* is found predominately in central and northern Europe, which is different from the climate found in Minnesota.

Reference(s):

- GBIF *Aegopodium podagraria* (2017). *Aegopodium podagraria* L. - Checklist View.
-



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

Answer / Justification:

A. podagraria... "can invade closed-canopy forests, inhibiting the establishment of conifers and other native tree species, and is often found in disturbed habitats such as pastures and logged areas. It forms dense patches that displace native species, and reduces species diversity in the ground layer."

Reference(s):

- Evergreen (2015). Evergreen - VA216 - Invasive-Plant-Profile-Goutweed.pdf.
-

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:

There is no evidence that suggests this plant promotes fire or changes fire regimes.

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

Answer / Justification:

No plant parts have been noted as poisonous. The plant does not impact grazing systems.

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

Answer / Justification:

The plant does create thick stands, but as a low-growing, herbaceous perennial it does not block or slow the movement of animals.

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: **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:

" Population expansion of goutweed likely occurs primarily by vegetative means from rhizomes."

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

Answer / Justification:

A. podagraria does not naturally produce detached fragments. As seen in question 11, it reproduced vegetatively via rhizomes.

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



Answer / Justification:

Information pertaining to the seed production, and viability of seed produced, is limited and mixed at best. "As of this writing (2009), no information is available on seed production in goutweed, but anecdotal evidence suggests goutweed may not be a prolific seed producer... goutweed only flowers and fruits on sunny sites. The flora of Nova Scotia indicated that variegated goutweed plants rarely produce fruit." "Seeds dispersed by goutweed plants in wildlands may have low germination rates [6], but in germination tests, goutweed seeds have shown moderate to high germination rates. In laboratory tests, 5% to 100% of goutweed seeds germinated after chilling at 41 °F (5 °C)."

Reference(s):

- Waggy, M. A. (2009). *Aegopodium podagraria*. In: Fire Effects Information System.
-

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

Answer / Justification:

This answer is based on an individual plant or fruiting stem. An entire stand, when considered as a whole, could potentially produce > 1,000 seeds/year.

Reference(s):

- [Anonymous] .
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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 *screeners* has a **Medium** confidence in this answer based on the available literature.



Answer / Justification:

"Seeds dispersed by goutweed plants in wildlands may have low germination rates [6], but in germination tests, goutweed seeds have shown moderate to high germination rates. In laboratory tests, 5% to 100% of goutweed seeds germinated after chilling at 41 °F (5 °C)."

Reference(s):

- Waggy, M. A. (2009). *Aegopodium podagraria*. In: Fire Effects Information System.
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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 *screeener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

"Plants may reach reproductive stage 5 to 7 years after germination..."

Reference(s):

- Waggy, M. A. (2009). *Aegopodium podagraria*. In: Fire Effects Information System.
 - Gatsuk, L. E., Smirnova O. V., Vorontzova L. I., Zaugolnova L. B., & Zhukova L. A. (1980). Age States of Plants of Various Growth Forms: A Review. *Journal of Ecology*. 68, 675–696.
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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 *screeener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

As an herbaceous perennial, *A. podagraria* flowers and sets seed once/year.



Reference(s):

- [Anonymous] .
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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 **Very High** confidence in this answer based on the available literature.

Answer / Justification:

There is no evidence to support that the propagules are dispersed long distances by animals.

Reference(s):

- [Anonymous] .
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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 not provided a confidence score on this question. Consider creating an issue on PRE so the screener can become aware of this detail.

Answer / Justification:

There is no evidence to support that the propagules are dispersed long distances by wind or water.

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

Answer / Justification:

There is no evidence of this, although it should be noted that the primary vector for dispersal to new areas is humans through intentional plantings.

Reference(s):

- National Park Service (2009). PCA Alien Plant Working Group - Goutweed (*Aegopodium podgraria*).
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Total PRE Score

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

Confidence: 82 / 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:

- Chel Anderson December 27, 2017
- Laura Van Riper 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.

There are currently no issues associated with this evaluation.



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.