Plant Risk Evaluator -- PRE™
Evaluation Report

Leucanthemum vulgare -- Minnesota

2017 Farm Bill PRE Project

PRE Score: 16 -- Reject (high risk of invasiveness)
Confidence: 80 / 100
Questions answered: 19 of 20 -- Valid (80% or more questions answered)

Privacy: Public
Status: Completed

Evaluation Date: September 7, 2017

This PDF was created on June 15, 2018

Plant Evaluated

Leucanthemum vulgare

Image by H. Zell

Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Leucanthemum vulgare*) 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

An excerpt from Wikipedia basically sums up this plant: "Leucanthemum vulgare became an introduced species via gardens into natural areas in parts of Canada, the United States, Australia, and New Zealand, where it is now a common weed. In some habitats it is an invasive species forming dense colonies displacing native plants and modifying existing communities, and is classified as a noxious weed." With a PRE score of 16, it is certainly one to avoid. Given the plant's prolific nature, this screener suspects that the germination rate is >25%, although no evidence could be readily found to support this.

General Information

Status: Completed
Screener: Mike Monterusso
Evaluation Date: September 7, 2017

Plant Information

Plant: *Leucanthemum vulgare*

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:

Leucanthemum vulgare has naturalized throughout North America.

Reference(s):

- United States Department of Agriculture (2017). Plants Profile for Leucanthemum vulgare (oxeye daisy).

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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:

It has naturalized in Wisconsin and Minnesota.

Reference(s):

- United States Department of Agriculture (2017). Plants Profile for Leucanthemum vulgare (oxeye daisy).

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's a noxious weed and invasive in several US states.

Reference(s):

- Invasive Plant Atlas of the United States (2017). oxeye daisy: Leucanthemum vulgare (Asterales: Asteraceae): Invasive Plant Atlas of the United States.
- United States Department of Agriculture (2017). Plants Profile for Leucanthemum vulgare (oxeye daisy).

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

Answer / Justification:

It is listed as non-native and invasive in Wisconsin.

Reference(s):

- Wisconsin Department of Natural Resources (2013). Invasive Species Photo Gallery - Wisconsin DNR.
- United States Department of Agriculture (2017). Plants Profile for Leucanthemum vulgare (oxeye daisy).

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

Answer / Justification:

None found.

Reference(s):

- [Anonymous] .

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

Answer / Justification:

Most occurrences of this plant are in Europe.

Reference(s):

- GBIF (2016). Leucanthemum vulgare.

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

Answer / Justification:

"The dainty flowers have escaped cultivation and now crowd out other plants on many rangelands"

Reference(s):

- Elpel, T. J., & Sherman P. G. (2017). Chrysanthemum leucanthemum: Oxeye Daisy. Weed control, history and uses..
- Invasives, T. (2007). Texas Invasives.org - Leucanthemum vulgare.

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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:

No evidence found.

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: **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:

" Livestock and probably other herbivores eat the foliage occasionally". "It ... is a problem in pastures where beef and dairy cattle graze, as usually they will not eat it, thus enabling it to spread."

Reference(s):

- Illinois Wildflowers (2017). Ox-Eye Daisy (Leucanthemum vulgare).
- Wikipedia (2017). Leucanthemum vulgare.

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

Answer / Justification:

No evidence found.

Reference(s):

- [Anonymous] .

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

Answer / Justification:

"As the plant matures, it develops a spreading rootstock and short rhizomes from which further shoots can occur. In the absence of competition a single plant can spread to produce 75 flowering shoots and nearly 400 inflorescences in two years."

Reference(s):

- CABI (2015). Leucanthemum vulgare (oxeye daisy).
- Invasives, T. (2007). Texas Invasives.org - Leucanthemum vulgare.

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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:

This generally requires human intervention: "Vegetative reproduction can also occur from rhizome fragments after cultivation."

Reference(s):

- CABI (2015). Leucanthemum vulgare (oxeye daisy).

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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:

"Seeds are viable as soon as they are shed and show little or no dormancy."

Reference(s):

- CABI (2015). Leucanthemum vulgare (oxeye daisy).
- Invasives, T. (2007). Texas Invasives.org - Leucanthemum vulgare.

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

- 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:

"Seed production can approach 300 seeds per inflorescence and 10,000 per m2."

Reference(s):

- CABI (2015). Leucanthemum vulgare (oxeye daisy).
- United States Department of Agriculture (2015). Field Guide for Managing Oxeye Daisy in the Southwest.

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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?

Reference(s):

- [Anonymous] .

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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: **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:

"In the absence of competition a single plant can spread to produce 75 flowering shoots and nearly 400 inflorescences in two years."

Reference(s):

- CABI (2015). Leucanthemum vulgare (oxeye daisy).
- Victorian Resources Online, Agriculture Victoria (2017). Invasiveness Assessment - Ox-eye daisy (Leucanthemum vulgare) in Victoria (Nox).

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

Answer / Justification:

No evidence found.

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

Answer / Justification:

"The main biotic transmission is via the gut of grazing animals. It is not palatable to cattle but seeds can survive passage through the gut of cattle (Bos species) and of horses (Equus ferus caballus). The plant is however palatable to sheep (Ovis aries) and goats (Capra aegagrus), but seeds do not apparently survive passage through sheep..."

Reference(s):

- CABI (2015). Leucanthemum vulgare (oxeye daisy).
- United States Department of Agriculture (2015). Field Guide for Managing Oxeye Daisy in the Southwest.

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

Answer / Justification:

While this is possible, it's unlikely to occur over long distances. "Natural dispersal is limited but may occur by strong winds, or water movement."

Reference(s):

- CABI (2015). Leucanthemum vulgare (oxeye daisy).

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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: **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:

" Accidental introduction will occur locally and over long distance as a result of contamination of hay or of pasture seed mixes. Along roadsides, seeds are no doubted carried by traffic and by the winds created by traffic. Intentional introduction may occur for planting as an ornamental, though this is discouraged in favour of the larger flowered and less persistent Shasta daisy (L. x superbum). L. vulgare may also be introduced for medicinal purposes."

Reference(s):

- CABI (2015). Leucanthemum vulgare (oxeye daisy).
- United States Department of Agriculture (2015). Field Guide for Managing Oxeye Daisy in the Southwest.

Total PRE Score

PRE Score: 16 -- Reject (high risk of invasiveness)
Confidence: 80 / 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:

• 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.