Plant Risk Evaluator -- PRE™
Evaluation Report

Leymus arenarius 'Blue Dune' -- Minnesota

2017 Farm Bill PRE Project

PRE Score: 17 -- Reject (high risk of invasiveness)
Confidence: 77 / 100
Questions answered: 20 of 20 -- Valid (80% or more questions answered)

Privacy: Public
Status: Submitted

Evaluation Date: August 16, 2017

This PDF was created on June 15, 2018

Plant Evaluated

Leymus arenarius 'Blue Dune'

Image by plantes-shopping

Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Leymus arenarius 'Blue Dune'*) 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

Leymus arenarius 'Blue Dune' as a cultivar differs from the parent species in color, size, and heat/drought tolerance, but is otherwise very similar to the parent species. Therefore, this evaluation was conducted using the parent species as the primary reference. The relatively high PRE score of 17 should be considered in the context of where the plant typically grows, which is beach environments. Because the plant is restricted for sale in the coastal counties of Wisconsin, which is a state with a similar climate to Minnesota, the invasive characteristic is extended to all of Minnesota. In Minnesota, Leymus arenarius could become a problem along Lake Superior and in isolated lake shore environments.

General Information

Status: Submitted
Screener: Mike Monterusso
Evaluation Date: August 16, 2017

Plant Information

Plant: *Leymus arenarius 'Blue Dune'*

If the plant is a cultivar, how does its behavior differs from its parent's?
L. 'Blue Dune' reportedly has a bluer color and is more drought tolerant than the parent species.

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:

Leymus arenarius has naturalized in several states and provinces bordering the Great Lakes.

Reference(s):

- United States Department of Agriculture (2017). Plants Profile for Leymus arenarius (sand ryegrass).

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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:

Leymus arenarius has naturalized in Wisconsin.

Reference(s):

- United States Department of Agriculture (2017). Plants Profile for Leymus arenarius (sand ryegrass).

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:

"Leymus arenarius is an invasive grass of coastal beaches and dunes where it appears to be spreading quickly and outcompeting the native flora in regions were the plant was naturalised."

Reference(s):

- University of Wisconsin, Green Bay (2017). Invasive Plants of Wisconsin: Leymus arenarius, lyme grass.
- Plants Rescue (2017). Plants & Flowers » Leymus arenarius.

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

Answer / Justification:

"Leymus arenarius is an invasive grass of coastal beaches and dunes where it appears to be spreading quickly and outcompeting the native flora"

Reference(s):

- University of Wisconsin, Green Bay (2017). Invasive Plants of Wisconsin: Leymus arenarius, lyme grass.

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:

No evidence 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 **High** confidence in this answer based on the available literature.

Answer / Justification:

Considering the distribution indicated on GBIF, most occurrences are in Northern and Western Europe.

Reference(s):

- GBIF (2016). GBIF Backbone Taxonomy.

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:

"Leymus arenarius is an invasive grass of coastal beaches and dunes where it appears to be spreading quickly and outcompeting the native flora."

Reference(s):

- University of Wisconsin, Green Bay (2017). Invasive Plants of Wisconsin: Leymus arenarius, lyme grass.
- Plants Rescue (2017). Plants & Flowers » Leymus arenarius.
- Michigan Department of Natural Resources (2017). Lyme Grass photos and ID - 1. Lyme Grass photos and ID.pdf.

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

Answer / Justification:

“Elymus arenarius (syn. of Leymus arenarius) is “a robust bluish-grey perennial, forming large tufts or masses...” Greatly changes the frequency and intensity of fire risk.

Reference(s):

- Victorian Resources Online, Agriculture Victoria (2017). Leymus (Leymus arenarius).

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

Answer / Justification:

No evidence found.

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 *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:

L. arenarius spreads by underground rhizomes and can establish from any root segments remaining in the ground.

Reference(s):

- SOS Dunes (2009). Microsoft Word - LymeGrass_FinalReport2009_BMartinus.doc - LymeGrass_FinalReport2009_BMartinus.pdf.
- University of Wisconsin, Green Bay (2017). Invasive Plants of Wisconsin: Leymus arenarius, lyme grass.
- Plants Rescue (2017). Plants & Flowers » Leymus arenarius.

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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: **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:

"It appears to spread vegetatively from the point of colonization to form clones."

Reference(s):

- University of Wisconsin, Green Bay (2017). Invasive Plants of Wisconsin: Leymus arenarius, lyme grass.

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

Answer / Justification:

L. arenarius does produce viable seed, although the spread of the plant via seed is reported to be slow and the seeds may not be particularly viable.

Reference(s):

- United States Department of Agriculture (2017). Conservation Plant Characteristics for ScientificName (CommonName) - USDA PLANTS.
- Kollmansberger, A. (2007). Leymus arenarius (L.) Hochst. Weed Risk Assessment -- Wisconsin DNR.

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

Answer / Justification:

"May produce four or more flowering stems as it is a tufted grass; 300 seeds/spike x 4 spikes=1,200"

Reference(s):

- Victorian Resources Online, Agriculture Victoria (2017). Leymus (Leymus arenarius).

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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: **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:

While no specific germination rate was found, L. arenarius does produce viable seed and spread via seed is reported to be slow.

Reference(s):

- United States Department of Agriculture (2017). Conservation Plant Characteristics for ScientificName (CommonName) - USDA PLANTS.

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

Answer / Justification:

"May produce propagules between 1-2 years after germination, or vegetative propagules become separate individuals between 1-2 years."

Reference(s):

- Victorian Resources Online, Agriculture Victoria (2017). Leymus (Leymus arenarius).

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

Answer / Justification:

L. arenarius sets seed once in early summer. Seeds ripen in fall.

Reference(s):

- Plants For A Future (PFAF) (2017). Leymus arenarius Lyme Grass, Sand ryegrass PFAF Plant Database.

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

Answer / Justification:

"Very light, wind dispersed seeds, or bird dispersed seeds, or has edible fruit that is readily eaten by highly mobile animals...Frequent strong gales disperse the seed, or it is grazed by flocks of grey lag geese... Very likely that at least one propagule will disperse greater than one kilometre."

Reference(s):

- Victorian Resources Online, Agriculture Victoria (2017). Leymus (Leymus arenarius).

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

Answer / Justification:

"Very light, wind dispersed seeds, or bird dispersed seeds, or has edible fruit that is readily eaten by highly mobile animals...Frequent strong gales disperse the seed, or it is grazed by flocks of grey lag geese... Very likely that at least one propagule will disperse greater than one kilometre." Given that L. arenarius is a beach species, it's conceivable that seed could be transported long distances by water.

Reference(s):

- Victorian Resources Online, Agriculture Victoria (2017). Leymus (Leymus arenarius).

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

Answer / Justification:

No evidence found.

Reference(s):

- [Anonymous] .

Total PRE Score

PRE Score: 17 -- Reject (high risk of invasiveness)
Confidence: 77 / 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	December 18, 2017
• Tom Buechel	November 10, 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 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.