Plant Risk Evaluator -- PRE™
Evaluation Report

Portulaca grandiflora -- Texas

2017 Farm Bill PRE Project

PRE Score: 15 -- Evaluate this plant further
Confidence: 70 / 100
Questions answered: 20 of 20 -- Valid (80% or more questions answered)

Privacy: Public
Status: Completed

Evaluation Date: September 30, 2017

This PDF was created on July 06, 2018

Plant Evaluated

Portulaca grandiflora

Image by MBOT

Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Portulaca grandiflora*) 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

Portulaca grandiflora is widely naturalized across the Eastern U.S. and is considered invasive in Australia, New Zealand, and the Galapagos Islands. Plants have the potential to produce copious amounts of seed and are noted as being prolific self seeders. The species does not overtop and smother native vegetation. More information is needed on the impacts of the pressence of P. grandiflora in natural systems.

General Information

Status: Completed
Screener: Kim Taylor
Evaluation Date: September 30, 2017

Plant Information

Plant: *Portulaca grandiflora*

If the plant is a cultivar, how does its behavior differs from its parent's?
This evaluation is for the species, not a particular cultivar.

Regional Information

Region Name: Texas

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:

Kartesz indicates Portulaca grandiflora is naturlized sporadically across eastern North America, from New Mexico North to Canada and eastward. USDA Plants indicates it is also naturalized in Puerto Rico, Ontario, and Manitoba.

Reference(s):

- Kartesz, J. T. (2015). The Biota of North America Program (BONAP).
- USDA, & NRCS (2017). The Plants Database.

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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:

Kartesz indicates Portulaca grandiflora is naturlized sporadically across eastern North America, from New Mexico North to Canada and eastward, including Texas.

Reference(s):

- Kartesz, J. T. (2015). The Biota of North America Program (BONAP).

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

Answer / Justification:

The Global Compendium of Weeds identifies the species as "casual alien, cultivation escape, environmental weed, garden thug, naturalised, weed". Pacific Island Ecosystems at Risk indicates the species is invasive on the Galapagos Islands, Australia, and New Zealand.

Reference(s):

- Pacific Island Ecosystems at Risk (PIER) (0). Portulaca grandiflora (PIER species info).
- Global Compendium of Weeds (GCW) (0). Portulaca grandiflora information from the Global Compendium of Weeds (GCW).

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

Answer / Justification:

Pacific Island Ecosystems at Risk indicates the species is invasive on the Galapagos Islands, Australia, and New Zealand. Areas where the species is noted to occur in GBIF in Australia and New Zealand share a similar climate to Texas.

Reference(s):

- Pacific Island Ecosystems at Risk (PIER) (0). Portulaca grandiflora (PIER species info).
- GBIF (0). Portulaca grandiflora Hook. - gbif.

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5. Are other species of the same genus (or closely related genera) invasive in a similar climate?

- 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:

Portulaca amilis is naturalized in the southeastern U.S., including in Texas. Portulaca oleracea is noted by the Global Compendium of Weeds as an "agricultural weed, casual alien, cultivation escape, environmental weed, garden thug, naturalised, noxious weed, weed" and is adventive across most of the U.S.. It is listed as invasive in China, Mexico, and Australia, all of which have regions which share a climate with Texas. 14 additional species of Portulaca are listed in the Global Compendium of Weeds.

Reference(s):

- Global Compendium of Weeds (0). Global Compendium of Weeds: species index.
- Pacific Island Ecosystems at Risk (PIER) (0). Portulaca oleracea (PIER species info).
- Global Compendium of Weeds (GCW) (0). Portulaca oleracea information from the Global Compendium of Weeds (GCW).
- Kartesz, J. T. (2015). The Biota of North America Program (BONAP).

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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:

Less than half of the species range has a similar climate to Texas.

Reference(s):

- GBIF (0). Portulaca grandiflora Hook. - gbif.

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: **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:

I found no records indicating the species overtops and dominates the plant communities where it is naturalized. It is a low growing plant that is unlikely to smother native plants.

Reference(s):

- [Anonymous] .

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

Answer / Justification:

Plants are low growing plant with semi-succulent leaves. It is noted as being "Moderately flammable". There is no direct evidence that the species modifies fire regimes.

Reference(s):

- Plants and Me (0). Portulaca grandiflora.

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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:

Not known to be toxic.

Reference(s):

- Plants for a Future (0). Portulaca grandiflora Rose Moss PFAF Plant Database.

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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:

Portulaca grandiflora does not form thickets. It is a low growing forb.

Reference(s):

- Pacific Island Ecosystems at Risk (PIER) (0). Portulaca grandiflora (PIER species info).

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

Answer / Justification:

"Portulaca grandiflora can root from the stem nodes when they make contact with the soil."

Reference(s):

- Pacific Island Ecosystems at Risk (PIER) (0). Portulaca grandiflora (PIER species info).

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

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

Answer / Justification:

"Plants may self-seed." seed is viable

Reference(s):

- Pacific Island Ecosystems at Risk (PIER) (0). Portulaca grandiflora (PIER species info).
- Missouri Botanical Garden PlantFinder (0). Portulaca grandiflora - Plant Finder.

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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:

"normally Portulaca grandiflora capsules contain 200 or more seeds." Seed number per capsule appears variable but it is highly likely that a plant will produce a minimum of 5 flowers, which would yield 1000 seeds if each contained 200 seeds.

Reference(s):

- Pacific Island Ecosystems at Risk (PIER) (0). Portulaca grandiflora (PIER species info).

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

Answer / Justification:

"Seed - sow early spring in a greenhouse, pricking out the seedlings into individual pots when they are large enough to handle. Plant out after the last expected frosts. The seed can also be sown in situ in late spring, though the plants will not grow so large this way." There does not appear to be a long dormancy period.

Reference(s):

- Plants for a Future (0). Portulaca grandiflora Rose Moss PFAF Plant Database.

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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:

This species is an annual which flowers the first year.

Reference(s):

- efloras.org (0). Portulaca grandiflora in Flora of North America @ efloras.org.

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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: **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:

"Bloom Time: June to frost" "It is in flower from Jun to July, and the seeds ripen from Jul to August." "Flowering late spring-fall."

Reference(s):

- Missouri Botanical Garden PlantFinder (0). Portulaca grandiflora - Plant Finder.
- Plants for a Future (0). Portulaca grandiflora Rose Moss 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: **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:

Propagules do not appear to be animal dispersed. "Portulaca grandiflora has seeds that just fall from the capsule."

Reference(s):

- Pacific Island Ecosystems at Risk (PIER) (0). Portulaca grandiflora (PIER species info).

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

Answer / Justification:

Propagules are not reported as wind or water dispersed. "Portulaca grandiflora has seeds that just fall from the capsule."

Reference(s):

- Pacific Island Ecosystems at Risk (PIER) (0). Portulaca grandiflora (PIER species info).

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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:

There is no evidence of this.

Reference(s):

- [Anonymous] .

Total PRE Score

PRE Score: 15 -- Evaluate this plant further
Confidence: 70 / 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:

• Hans Landel	December 18, 2017
• Steve Moore	October 4, 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.