Plant Risk Evaluator -- PRE™
Evaluation Report

Phytolacca americana -- Washington

2022 Western IPM Grant Project

PRE Score: 15 -- Moderate Potential Risk
Confidence: 90 / 100
Questions answered: 20 of 20 -- Valid (80% or more questions answered)

Privacy: Public
Status: Completed

Evaluation Date: September 28, 2022

This PDF was created on May 23, 2025

This project was funded in part by the USDA National Institute of Food and Agriculture through the Western Integrated Pest Management Center, grant number 2018-70006-28881.

Plant Evaluated

Phytolacca americana

Image by Ron Vanderhoff, Orange County CNPS

Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Phytolacca americana*) 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

Phytolacca americana (common pokeweed) is a large (to 7m tall), taprooted perennial herb characteristic of open, disturbed places. Native to the southeastern United States, the species has become established in disturbed habitats in the eastern and midwestern U.S. and along the Pacific Coast of the U.S., persisting in some habitats. It is also naturalized in parts of South America, Africa, Asia, and throughout Europe. P. americana is autogamous (capable of self-pollination) and is a prolific producer of seeds which can remain viable in the soil for decades. Although consumed within its native range, all parts of the plant, but especially the roots and seeds, contain toxins that are poisonous to humans and other mammals when ingested without careful preparation. Phytolacca americana may be troublesome weed in some agricultural situations. In natural areas it seldom forms large or dense infestations and seldom persists away from frequently disturbed places. In the Pacific Northwest P. americana appears to pose only a moderate risk as an invasive species.

General Information

Status: Completed
Screener: Jim Evans
Evaluation Date: September 28, 2022

Plant Information

Plant: *Phytolacca americana*

Regional Information

Region Name: Washington

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 on an article published by PLOS One, which can be found 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** point(s) to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Phytolacca americana (common pokeweed) is widely naturalized. Native to the southeastern United States, the species is naturalized in more than 30 counties in California (Calflora 2022), throughout Europe (PlantRight climate match, Invasoras.pt), in Central and South America, East Asia, and elsewhere (PlantRight climate match).

Reference(s):

- Calflora (0). Phytolacca americana L. ; American pokeweed, Pokeberry.
- Invasoras.pt (2017). Phytolacca americana.
- [Anonymous] (0). PlantRight.

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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** point(s) to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

The species distribution along the west coast and fringes of the Appalachian chain lies in areas of similar climate to Washington and the Pacific Northwest, as does its distribution throughout most of Europe. (PlantRight climate match).

Reference(s):

- [Anonymous] (0). PlantRight.

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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** point(s) to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

P. americana is considered invasive in Portugal, where it inhibits the development of native vegetation (Invasoras.pt). In California the species is listed as ‘Limited’ – invasive. but current information indicates their ecological impacts are minor on a statewide level but the species may be locally persistent and problematic (California Invasive Plant Council no date).

Reference(s):

- California Invasive Plant Council (2007). Phytolacca americana. 2022,
- Invasoras.pt (2017). Phytolacca americana.

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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** point(s) to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Areas where P. americana is considered invasive and which match Washington's climate include California and Portugal (California Invasive Plant Council, Invasoras.pt, PlantRight Climate Match).

Reference(s):

- California Invasive Plant Council (2007). Phytolacca americana. 2022,
- Invasoras.pt (2017). Phytolacca americana.
- [Anonymous] (0). PlantRight.

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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** point(s) to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Neither the Invasive Plant Atlas of the United States nor the Global Invasive Species Database lists another species of Phytolacca nor any species in the Phytolaccaceae. Mexican pokeweed (Phytolacca heterotepala), a native of Central and South America, is A-listed ("pests of the agricultural industry or environment which score high and are not known to occur or under official control in the State of California)" by the California Department of Food and Agriculture (Randhawa 2018) but does not occur in a climate similar to the Pacific Northwest (PlantRight climate matching results for Phytolacca heterotepala).

Reference(s):

- Invasive Plant Atlas of the United States (0). Herbs/Forbs: Invasive Plant Atlas of the United States.
- Global Invasive Species Database (2022). Global Invasive Species Database.
- Randhawa, R. (2018). Mexican pokeweed | Phytolacca heterotepala H. Walter. Pest Rating Proposals and Final Ratings. 2022,
- [Anonymous] (0). PlantRight.

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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** point(s) to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Major portions of P. americana's range lie outside of areas with climate similar to Washington. These areas include the species' native range in the southeastern U.S., the Eastern Seaboard, the midwestern U.S., the east coast of South America, eastern Europe, and China and Southeast Asia (PlantRight Climate Match).

Reference(s):

- [Anonymous] (0). PlantRight.

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** point(s) to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Sellers et al. (2013) state that P. americana "rarely infests large areas," except in agricultural fields.

Reference(s):

- Sellers, B., Devkota P., & Ferrell J. (2013). Common pokeweed. 2022,

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8. Is the plant noted as promoting fire and/or changing fire regimes?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

P. americana exhibited an increase in cover from near 0% up to 5% following fire in pine forests in Michigan (Gucker 2005) and fire was judged important in recruitment for the species in deciduous forest in Ohio (Smith 2010). However, the species' response was small relative to the overall composition of the plant communities studied, and none of the literature reviewed for this evaluation suggested that P. americana has a significant effect on fire regimes.

Reference(s):

- Gucker, C. (2005). Research Project Summary: Effects of surface fires in a mixed red and eastern white pine stand in Michigan. Fire Effects Information System. 2022,
- Smith, J. (2010). Research Project Summary: Effects of experimental burning on understory plants in a temperate deciduous forest in Ohio. Fire Effects Information System2022.

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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** point(s) to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Although people in the southeastern U.S. have traditionally harvested and eaten the shoots and leaves of P. americana (after careful preparation), all parts of the plant contain toxins, capable of causing illness and, in rare cases, death to humans, livestock, and other mammals. The greatest concentrations of toxins are in the roots and seeds (Sellers et al. 2013, Thieret 2012).

Reference(s):

- Sellers, B., Devkota P., & Ferrell J. (2013). Common pokeweed. 2022,
- Thieret, J. (2012). Phytolacca americana var. americana. 2022,

10. Does the plant produce impenetrable thickets, blocking or slowing movement of animals, livestock, or humans?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Since the species seldom infests large areas it is unlikely to form stands that impede the movement of animals, livestock, or humans

Reference(s):

- Sellers, B., Devkota P., & Ferrell J. (2013). Common pokeweed. 2022,

Reproductive Strategies (Questions 11 - 17)

11. Does this species (or cultivar or variety) reproduce and spread vegetatively?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

The USDA Plants Database rates P. americana’s vegetative spread rate as “None.”

Reference(s):

- USDA Plants Database (2022). Phytolacca americana L., .

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** point(s) to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Naturally detached fragments of P. americana do not produce new plants.

Reference(s):

- USDA Plants Database (2022). Phytolacca americana L., .

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13. Does the species (or cultivar or variety) commonly produce viable seed?

- Answer: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Orock (2005) reported that, on average, 96.4% of P. americana seed in bird-consumed samples were viable and 97% of seeds in control samples were viable.

Reference(s):

- Orock, J. (2005). The effect of gut passage by two species of avian frugivore on seeds of pokeweed, Phytolacca americana. Canadian Journal of Botany. 83, 427–431.

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

- Answer: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Armesto et al. (1983) reported averages of approximately 9.7 seeds/fruit, 58 fruits/raceme, and 2.7 racemes/plant for a total of approximately 1500 seeds/ plant in a wild population of P. americana in the eastern U.S. Sellers et al. (2013) reported that individual plants are capable of producing over 48,000 seeds, though the authors do not provide data or a citation supporting this assertion.

Reference(s):

- Armesto, J., Cheplick G., & McDonnell M. (1893). Observations on the Reproductive Biology of Phytolacca americana (Phytolaccaceae). Bulletin of the Torrey Botanical Club. 110(3), 380- 383.
- Sellers, B., Devkota P., & Ferrell J. (2013). Common pokeweed. 2022,

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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** point(s) to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Several laboratory studies have reported germination rates of P. americana not lower than 25% and mostly between 80-99% (Armesto et al. 1983, Orock 2005).

Reference(s):

- Armesto, J., Cheplick G., & McDonnell M. (1893). Observations on the Reproductive Biology of Phytolacca americana (Phytolaccaceae). Bulletin of the Torrey Botanical Club. 110(3), 380- 383.
- Orock, J. (2005). The effect of gut passage by two species of avian frugivore on seeds of pokeweed, Phytolacca americana. Canadian Journal of Botany. 83, 427–431.

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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** point(s) to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Patches (2014) reported that, during both years of a two-year field study in Pennsylvania, spring-emergent seedlings of P. americana produced mature fruits and seeds by the end of their first growing season.

Reference(s):

- Patches, K. (2014). Common Pokeweed (Phytolacca americana L.) Management in Pennsylvania Field Crops. Department of Plant Science. Master of Science, 90.

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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** point(s) to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Although Calflora reports the bloom period in California as two months (July-August) Armesto et al. (1983) and McDonnell et al. (1984) report flower and fruit production lasting from early summer through late fall in the species native range in the eastern U.S. In Portugal the species reportedly blooms from May to December (Invasoras.pt 2017).

Reference(s):

- McDonnell, M., Stiles E., Cheplick G., & Armesto J. (1984). Bird-dispersal of Phytolacca americana L. and the influence of fruit removal on subsequent development.. American Journal of Botany. 71, 895–901.
- Armesto, J., Cheplick G., & McDonnell M. (1893). Observations on the Reproductive Biology of Phytolacca americana (Phytolaccaceae). Bulletin of the Torrey Botanical Club. 110(3), 380- 383.
- Calflora (0). Phytolacca americana L. ; American pokeweed, Pokeberry.
- Invasoras.pt (2017). Phytolacca americana.

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** point(s) to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Birds, unaffected by the toxicity of P. americana, consume the species' fleshy fruits and are the principal agents of seed dispersal for P. americana (McDonnell et al. 1984, Orock 2005).

Reference(s):

- McDonnell, M., Stiles E., Cheplick G., & Armesto J. (1984). Bird-dispersal of Phytolacca americana L. and the influence of fruit removal on subsequent development.. American Journal of Botany. 71, 895–901.
- Orock, J. (2005). The effect of gut passage by two species of avian frugivore on seeds of pokeweed, Phytolacca americana. Canadian Journal of Botany. 83, 427–431.

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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** point(s) to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

None of the available literature mentions wind or water as means of dispersal for P. americana. Birds are the principal agents of dispersal (McDonnell et al. 1984, Orock 2005).

Reference(s):

- McDonnell, M., Stiles E., Cheplick G., & Armesto J. (1984). Bird-dispersal of Phytolacca americana L. and the influence of fruit removal on subsequent development.. American Journal of Botany. 71, 895–901.
- Orock, J. (2005). The effect of gut passage by two species of avian frugivore on seeds of pokeweed, Phytolacca americana. Canadian Journal of Botany. 83, 427–431.

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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** point(s) to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

None of the available literature suggests that these vectors are frequent means of dispersal for P. americana.

Reference(s):

- [Anonymous] .

Total PRE Score

PRE Score: 15 -- Moderate Potential Risk
Confidence: 90 / 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 : Low Potential Risk
13 - 15 : Moderate Potential Risk
> 15 : High Potential Risk

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: 2022 Western IPM Grant 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:

• Wendy Descamp	October 24, 2022
• Jutta Burger	October 23, 2022
• Alex Simmons	October 12, 2022

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 info@plantright.org if additional action is required to resolve open issues.

Issue ID # 8303

Date Created: October 23, 2022 - 4:34pm
Date Updated: November 9, 2022 - 11:56am

Submitted by: Jutta Burger

Status: Fixed
Type: Suggestion
Severity: Major
Scope: Q16. Does this plant produce viable seed within the first three years (for an herbaceous species) to five years (for a woody species) after germination?

Issue Description

Patches (2014) conducted a fairly detailed germination and fecundity experiment in which they reported plants producing fruit definitely in year 2 and possibly in year 1 (hard to tell from text). Also, Cal-IPC's 2007 plant assessment of the plant lists time to maturity as less than 3 yrs (though no references are directly provided). Suggest changing to "yes" with "high" (or very high?) confidence.

Issue Resolution (Screener's Response to Issue)

Thank you for the excellent reference. Accordingly, I changed the answer to 'Yes' with the following Rationale: "Patches (2014) reported that, during both years of a two-year field study in Pennsylvania, spring-emergent seedlings of P. americana produced mature fruits and seeds by the end of their first growing season." I rated confidence as High because the reference was not a peer-reviewed publication.

Issue ID # 8302

Date Created: October 23, 2022 - 4:04pm

Date Updated: November 14, 2022 - 10:29am

Submitted by: Jutta Burger

Status: Fixed
Type: Suggestion
Severity: Minor
Scope: Q05. Are other species of the same genus invasive in a similar climate?

Issue Description

Review the introduced distribution of Mexican pokeweed (Phytolacca heterotepala) to see if it matches that of WA. This species has been "A"-listed by CDFA. https://blogs.cdfa.ca.gov/Section3162/?p=4923. If it matches, the answer to this question should be "Yes". - Jutta Burger

Issue Resolution (Screener's Response to Issue)

Phytolacca heterotepala does not exhibit a climate match with the Pacific Northwest. The answer and confidence level for this question remain unchanged. I added the following passage to the rationale: "Mexican pokeweed (Phytolacca heterotepala), a native of Central and South America, is A-listed (“pests of the agricultural industry or environment which score
high and are not known to occur or under official control in the State of California)” by the California Department of Food and Agriculture (Randhawa 2018) but does not occur in a climate similar to the Pacific Northwest (PlantRight climate matching results for Phytolacca heterotepala)."

Issue ID # 8301

Date Created: October 23, 2022 - 3:56pm
Date Updated: November 9, 2022 - 12:06pm

Submitted by: Jutta Burger

Status: Fixed
Type: Comment
Severity: Minor
Scope: Q04. Is the species (or cultivar or variety) noted as being invasive in the US or world in a similar climate?

Issue Description

The Cal-IPC plant assessment that was conducted was from 2007. Best to add that date in the reference rather than use 2022. - Jutta Burger

Issue Resolution (Screener's Response to Issue)

Edited the source reference to include the publication year 2007.

Issue ID # 8285

Date Created: October 12, 2022 - 2:47pm
Date Updated: October 14, 2022 - 11:11am

Submitted by: Alex Simmons

Status: Fixed
Type: Comment
Severity: Minor
Scope: Q07. Does this plant displace native plants and dominate the plant community in areas where it has been established?

Issue Description

I wonder if agricultural fields should be considered a "plant community" in this case? - Alex Simmons

Issue Resolution (Screener's Response to Issue)

The question asks specifically whether or not the plant displaces *native plants* (emphasis mine). Help resources didn't give any suggestion that agricultural systems be included when evaluating this question, so I didn't make any changes.

Issue ID # 8284

Date Created: October 12, 2022 - 2:43pm
Date Updated: October 14, 2022 - 11:25am

Submitted by: Alex Simmons

Status: Fixed
Type: Comment
Severity: Minor
Scope: Q03. Is the species (or cultivar or variety) noted as being invasive in the U.S. or world?

Issue Description

Does Invasoras list any of the dmage impact from this plant that caused it to be listed as invasive in Portugal? Not necessary, but just curious if there is more detail. -Alex Simmons

Issue Resolution (Screener's Response to Issue)

I edited the narrative for Q03 so that the fist sentence now reads: "P. americana is considered invasive in Portugal, where it inhibits the development of native vegetation," reflecting the statement about impacts from Invasoras.pt.

About PRE and this Plant Evaluation Report

The Plant Risk Evaluator (PRE) is an online database and platform designed to assess the risk of a plant becoming invasive in a given region.This tool offers many benefits, and we encourage you to visit the PRE website (https://pretool.org) for more information.

If you would like to learn more about PRE, please email us at info@plantright.org, requesting a PRE Account.

PRE beta funding was provided by Sustainable Conservation (https://www.suscon.org/) and a USDA Farm Bill grant. Additional funding has been provided by the Western Integrated Pest Management Center.