



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

Vinca major -- Texas

2017 Farm Bill PRE Project

PRE Score: 17 -- Reject (high risk of invasiveness)

Confidence: 69 / 100

Questions answered: 19 of 20 -- Valid (80% or more questions answered)

Privacy: Public

Status: Completed

Evaluation Date: September 30, 2017

This PDF was created on August 13, 2018



Plant Evaluated

Vinca major



Image by Alfredo F. Fuentes



Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Vinca major*) 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

Vinca major is naturalized across much of the U.S. and invasive in California, Georgia, South Carolina, and Texas. It spreads vegetatively, forming a dense monoculture, displacing native vegetation on the forest floor. Fragments are easily dispersed by water, machinery and dumping of garden waste.

General Information

Status: Completed

Screener: Kim Taylor

Evaluation Date: September 30, 2017

Plant Information

Plant: *Vinca major*

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

Answer / Justification:

Kartesz indicates *Vinca major* is naturalized across the eastern U.S., West coast, and southwest, including in Texas. USDA Plants indicates it is also naturalized in British Columbia. Grin indicates the species is also naturalized in Portugal, Spain, Eritrea, Ethiopia, Morocco, South Africa, Cyprus, Lebanon, Syria, India, Pakistan Australia, New Zealand, Ukraine, Austria, Hungary, Norway, Bulgaria, Greece, France, Portugal, Mexico, Costa Rica, Venezuela, Argentina, Chile, Uruguay, Ecuador, and Peru.

Reference(s):

- Kartesz, J. T. (2015). The Biota of North America Program (BONAP).
- USDA, & NRCS (2017). The Plants Database.
- U.S. National Plant Germplasm Network (0). Taxonomy - GRIN-Global Web v 1.9.9.2 *Vinca major*.

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:

Kartesz indicates *Vinca major* is naturalized across the eastern U.S., West coast, and southwest, including in 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 *screner* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

The Global Compendium of Weeds identifies the species as "agricultural weed, casual alien, cultivation escape, environmental weed, garden thug, naturalised, noxious weed, weed". USDA Plants indicates the species is listed invasive by the California Invasive Plant Council and the Southeast Exotic Pest Plant Council. The species is listed by TexasInvasives.org. EDD Maps indicates the species is invasive in California, Georgia, and South Carolina.

Reference(s):

- Invasive Plant Atlas of the United States (0). big periwinkle: *Vinca major* (Gentianales: Apocynaceae): Invasive Plant Atlas of the United States.
 - USDA, & NRCS (2017). The Plants Database.
 - Global Compendium of Weeds (0). *Vinca major* 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 *screner* has a **High** confidence in this answer based on the available literature.



Answer / Justification:

The Global Compendium of Weeds identifies the species as "agricultural weed, casual alien, cultivation escape, environmental weed, garden thug, naturalised, noxious weed, weed". USDA Plants indicates the species is listed invasive by the California Invasive Plant Council and the Southeast Exotic Pest Plant Council. The species is listed by TexasInvasives.org. EDD Maps indicates the species is invasive in California, Georgia, and South Carolina.

Reference(s):

- Invasive Plant Atlas of the United States (0). big periwinkle: *Vinca major* (Gentianales: Apocynaceae): Invasive Plant Atlas of the United States.
 - TexasInvasives.org (0). Texas Invasives *Vinca major*.
 - USDA, & NRCS (2017). The Plants Database.
 - Global Compendium of Weeds (0). *Vinca major* information from the Global Compendium of Weeds (GCW).
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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 *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Vinca minor is naturalized across a large part of the U.S., including Texas. Four additional species in the genus *Vinca* are listed in the Global Compendium of Weeds, including *V. minor* which occurs in Texas. EDD Maps indicates *V. minor* is invasive in Kentucky, Tennessee, Georgia, and South Carolina. Texas shares a similar climate with much of the Southeastern U.S..

Reference(s):

- Global Compendium of Weeds (0). Global Compendium of Weeds: species index.
 - Kartesz, J. T. (2015). The Biota of North America Program (BONAP).
-



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 *screeners* 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). *Vinca major* L. (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: **Yes**, which contributes **1** points to the total PRE score.
- The *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

"*V. major* forms dense stands that exclude other herbs and creates a problem in areas where it competes with native herbs. This species is a particular threat to the understory of riverine vegetation as it will spread from plant fragments carried by high flows. *V. major* forms dense mats which smother all native groundcover vegetation and prevent regeneration of trees and shrubs. This can have important long term consequences on streambanks, where the eventual loss of native tree and shrub cover could lead to erosion." "A fast growing plant that spreads mainly by vegetative growth. It is a vigorous creeper, occurring in large infestation in semi-shady conditions. The numerous intertwined stems form dense and thick mats that cover the ground, smother small plants and crowd out native species. Establishment of shrub and tree seedlings is prevented"



Reference(s):

- TexasInvasives.org (0). Texas Invasives *Vinca major*.
 - Pacific Island Ecosystems at Risk (PIER) (0). *Vinca major* (PIER species info).
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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 *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

"As of this writing (2009), there was no information available regarding the flammability of periwinkles. Some evidence suggests that periwinkles may alter local fuel characteristics by changing community structure, litter dynamics, fuel arrangement, and understory temperatures. In Michigan, understory structure in a mixed-hardwood dune successional forest was changed when mats of common periwinkle replaced canopy tree seedlings and herbaceous understory plants. Common periwinkle also greatly reduced the overall accumulation of leaf litter in this area. In mature oak-hickory forest in southwestern Illinois, common periwinkle in the understory led to an increase in the amount of vegetated surface area [88]. Near Sydney, Australia, areas dominated by bigleaf periwinkle had significantly cooler temperatures than sites with little bigleaf periwinkle cover (P

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

Answer / Justification:

"Large quantities of the plant are poisonous"

Reference(s):

- Plants For A Future (PFAF) (0). *Vinca major* Greater Periwinkle, Bigleaf periwinkle, Myrtle, Large Periwinkle, Big Periwinkle PFAF Plant Database.
-



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

Answer / Justification:

Vinca major is herbaceous and likely does not form thickets.

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

Answer / Justification:

"Found around old homesite plantings and scattered in open to dense canopied forests. Form mats and extensive infestations even under forest canopies by vines rooting at nodes, with viability of seeds yet to be reported." "Once established, this plant will spread aggressively, rooting at the nodes where the stems come in contact with the soil." "Vegetative regeneration is very important to the establishment and spread of both bigleaf and common periwinkles. Bigleaf periwinkle spreads with "great rapidity" by arching stolons, which root at the tips. Periwinkles form mats and extensive infestations even under forest canopies. Given their ability to spread with the dumping of yard waste, it is likely that periwinkles establish from plant fragments."

Reference(s):

- TexasInvasives.org (0). Texas Invasives *Vinca major*.
- Missouri Botanical Garden PlantFinder (0). *Vinca major* - Plant Finder.
- Stone, K. R. (2009). *Vinca major*, *V. minor*. In: Fire Effects Information System.



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

Answer / Justification:

"Biology & Spread: Floating vegetation/debris: High flood waters carry plant fragments downstream."
"Vegetative regeneration is very important to the establishment and spread of both bigleaf and common periwinkles. Bigleaf periwinkle spreads with "great rapidity" by arching stolons, which root at the tips. Periwinkles form mats and extensive infestations even under forest canopies. Given their ability to spread with the dumping of yard waste, it is likely that periwinkles establish from plant fragments."

Reference(s):

- TexasInvasives.org (0). Texas Invasives *Vinca major*.
 - Stone, K. R. (2009). *Vinca major*, *V. minor*. In: Fire Effects Information System.
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13. Does the species (or cultivar or variety) commonly produce viable seed?

- 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:

"Found around old homesite plantings and scattered in open to dense canopied forests. Form mats and extensive infestations even under forest canopies by vines rooting at nodes, with viability of seeds yet to be reported." "One review states that bigleaf periwinkle does not reproduce by seed in the wild in California, though occasional seedlings have been found" "Documentation of periwinkle establishment by seed is rare."

Reference(s):

- TexasInvasives.org (0). Texas Invasives *Vinca major*.
- Stone, K. R. (2009). *Vinca major*, *V. minor*. 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 **Very Low** confidence in this answer based on the available literature.

Answer / Justification:

"Slender, cylindrical fruit up to 2 in. (5 cm) long. Splitting when dry to release three to five seeds."

Reference(s):

- Invasive Plant Atlas of the United States (0). big periwinkle: *Vinca major* (Gentianales: Apocynaceae): Invasive Plant Atlas of the United States.
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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 *screeners* has a **Low** confidence in this answer based on the available literature.

Answer / Justification:

"In laboratory studies, common periwinkle seeds exhibited an "extended dormancy period"

Reference(s):

- Stone, K. R. (2009). *Vinca major*, *V. minor*. In: Fire Effects Information System.
-

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?



Reference(s):

- [Anonymous] .
-

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

Answer / Justification:

"Blooms April to May, then sporadically to September." "Solitary, tubular, phlox-like, pale violet-blue flowers (to 1 1/2" across) bloom on upright stalks from the leaf axils in spring, and usually continue to bloom intermittently throughout the summer into autumn." " Fl. Mar-May"

Reference(s):

- Invasive Plant Atlas of the United States (0). big periwinkle: *Vinca major* (Gentianales: Apocynaceae): Invasive Plant Atlas of the United States.
 - Missouri Botanical Garden PlantFinder (0). *Vinca major* - Plant Finder.
 - efloras.org (0). *Vinca major* in Flora of China @ efloras.org.
-

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

Answer / Justification:

no evidence of this.



Reference(s):

- [Anonymous] .
-

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

Answer / Justification:

"Biology & Spread: Floating vegetation/debris: High flood waters carry plant fragments downstream".
"Seed dispersal by wind has been recorded in warmer climates."

Reference(s):

- TexasInvasives.org (0). Texas Invasives *Vinca major*.
-

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

Answer / Justification:

GRIN indicates the species is a "potential seed contaminant". "Garden escape/garden waste: The most common means of spread is by vegetative material being dumped in garden refuse."

Reference(s):

- U.S. National Plant Germplasm Network (0). Taxonomy - GRIN-Global Web v 1.9.9.2 *Vinca major*.
- TexasInvasives.org (0). Texas Invasives *Vinca major*.



Total PRE Score

PRE Score: 17 -- Reject (high risk of invasiveness)

Confidence: 69 / 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:

- Charlotte Reemts November 13, 2017
- Trey Wyatt November 1, 2017
- Steve Moore October 4, 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.