



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

***Vinca major -- Georgia***

***2017 Farm Bill PRE Project***

**PRE Score:** 16 -- Reject (high risk of invasiveness)

**Confidence:** 70 / 100

**Questions answered:** 18 of 20 -- Valid (80% or more questions answered)

**Privacy:** Public

**Status:** Submitted

**Evaluation Date:** November 16, 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 already listed as an invasive in Georgia and South Carolina. Though it does not produce seeds often, this plant readily spreads by rooting at nodes when stems come in contact with the ground. It also spreads quickly and easily from fragments and cuttings.

## General Information

**Status:** Submitted

**Screener:** Lila Uzzell

**Evaluation Date:** November 16, 2017

## Plant Information

**Plant:** *Vinca major*

## Regional Information

**Region Name:** Georgia

## 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:

*Vinca major* is a very widespread naturalized species across Europe, Australia, and the United States. It grows readily in zones 7-9 and is considered invasive in some states within the U.S.

#### Reference(s):

- USDA, & NRCS (2017). The Plants Database.
- Missouri Botanical Garden PlantFinder (0). *Vinca major* - Plant Finder.
- GBIF (0). *Vinca major* L. (GBIF).
- Randall, R. Peter (2017). A Global Compendium of Weeds. Third Edition..

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

#### Answer / Justification:

This species grows in zones 7-9, and grows well in Mediterranean, Subtropical, and Tropical climates. In the U.S., *Vinca major* is found in every state with a similar climate to Georgias.



**Reference(s):**

- USDA, & NRCS (2017). The Plants Database.
  - Missouri Botanical Garden PlantFinder (0). *Vinca major* - Plant Finder.
  - GBIF (0). *Vinca major* L. (GBIF).
  - Randall, R. Peter (2017). A Global Compendium of Weeds. Third Edition..
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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 *screeener* has a **High** confidence in this answer based on the available literature.

**Answer / Justification:**

In the U.S. this species is invasive to Georgia, South Carolina, and California. The Global Compendium of Weeds lists this plant as invasive to Japan, South Africa, and Argentina.

**Reference(s):**

- Randall, R. Peter (2017). A Global Compendium of Weeds. Third Edition..
  - Georgia Invasive Species Task Force (2017). List of Non-native Invasive Plants in Georgia - Georgia Invasive Species Task Force.
  - South Carolina Exotic Pest Plant Council (2014). South Carolina Exotic Pest Plant Council Terrestrial Exotic Invasive Species List 2014.
  - 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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**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 *screeener* has a **Very High** confidence in this answer based on the available literature.



**Answer / Justification:**

This species is invasive to Georgia itself, and is listed by the GA-EPPC as a category 2, "Exotic plant that is a moderate problem in Georgia natural areas through invading native plant communities and displacing native species, but to a lesser degree than category 1 species." *V. major* is also invasive to South Carolina, where it the SC-EPPC considers it a "Sever threat". The CAL IPC says, "This aggressive grower has trailing stems that root wherever they touch the soil. Their ability to resprout from stem fragments enables periwinkle to spread rapidly in shady creeks and drainages, smothering the native plant community."

**Reference(s):**

- Georgia Invasive Species Task Force (2017). List of Non-native Invasive Plants in Georgia - Georgia Invasive Species Task Force.
  - South Carolina Exotic Pest Plant Council (2014). South Carolina Exotic Pest Plant Council Terrestrial Exotic Invasive Species List 2014.
  - California Invasive Plant Council (0). "Vinca major" – California Invasive Plant Council.
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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 also invasive to Georgia and other areas in a similar climate.

**Reference(s):**

- Randall, R. Peter (2017). A Global Compendium of Weeds. Third Edition..
  - Invasive Plant Atlas of the United States (0). common periwinkle: *Vinca minor* (Gentianales: Apocynaceae): Invasive Plant Atlas of the United States.
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## 6. Is the species (or cultivar or variety) found predominately in a climate matching the region of concern?

- Answer: **Yes**, which contributes **2** points to the total PRE score.
- The *screeners* has a **High** confidence in this answer based on the available literature.

### Answer / Justification:

Though *Vinca major* has a wide range, it seems as though >50% of its range is similar to Georgia's climate region. It is found in regions similar across the U.S., South Africa, Europe, Japan, China, and Australia.

### Reference(s):

- Global Compendium of Weeds (0). Global Compendium of Weeds: species index.
  - USDA, & NRCS (2017). The Plants Database.
  - Pacific Island Ecosystems at Risk (PIER) (0). *Vinca major* (PIER species info).
  - Global Compendium of Weeds (0). *Vinca major* information from the Global Compendium of Weeds (GCW).
  - GBIF (0). *Vinca major* L. (GBIF).
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## 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 **Very 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."



**Reference(s):**

- TexasInvasives.org (0). Texas Invasives *Vinca major*.
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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 *screeener* has a **Medium** confidence in this answer based on the available literature.

**Answer / Justification:**

More information is needed to answer this question, but *V. major* has the potential to affect fire intensity: " It is unclear how the presence of periwinkles may affect fire regimes in invaded communities. In ecosystems where periwinkles replace plants with similar fuel characteristics, they may alter fire intensity or slightly modify an existing fire regime. If periwinkle spread introduces novel fuel properties to the invaded ecosystem, fire behavior, and potentially fire regime, may be altered (see these citations: [14,26]). This topic warrants additional study."

**Reference(s):**

- Stone, K. R. (2009). *Vinca major*, *V. minor*. In: Fire Effects Information System.
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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 *screeener* has a **Medium** confidence in this answer based on the available literature.

**Answer / Justification:**

PFAF states that large quantities of *V. major* are poisonous, and South Africa considers *V. major* a poisonous plant. This species has not been noted to impact grazing systems.





**Reference(s):**

- Stone, K. R. (2009). *Vinca major*, *V. minor*. In: Fire Effects Information System.
  - Plants For A Future (PFAF) (0). *Vinca major* Greater Periwinkle, Bigleaf periwinkle, Myrtle, Large Periwinkle, Big Periwinkle 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 *screeener* has a **Low** confidence in this answer based on the available literature.

**Answer / Justification:**

There is no evidence of this, but given its descriptor of forming "dense low mats" it seems to only effect native plants, not animals or humans.

**Reference(s):**

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

**Answer / Justification:**

"Forms mats and extensive infestations even under forest canopies by vines rooting at nodes. "



**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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**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:**

"Vegetative regeneration is very important to the establishment and spread of both bigleaf ([74,113], reviews by [81,111]) and common ([66,88], review by [81]) periwinkles. Bigleaf periwinkle spreads with "great rapidity" by arching stolons, which root at the tips (review by [7]). Periwinkles form mats and extensive infestations even under forest canopies ([32], review by [72]). Given their ability to spread with the dumping of yard waste ([17,37], review by [10]), it is likely that periwinkles establish from plant fragments."

**Reference(s):**

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

**Answer / Justification:**

There is little information on seed viability for this species. However, production by seeds does not seem to be the most common method of dispersal. "One review states that bigleaf periwinkle does not reproduce by seed in the wild in California [7], though occasional seedlings have been found [21]. Common periwinkle rarely produces seeds."



**Reference(s):**

- Stone, K. R. (2009). *Vinca major*, *V. minor*. In: Fire Effects Information System.
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**14. Does this plant produce copious viable seeds each year (> 1000)?**

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screner* has a **Medium** confidence in this answer based on the available literature.

**Answer / Justification:**

There is little information on the seeds produced by *V. major*. Each fruit contains three to five seeds, but the amount of fruit produced is not given. It seems as though this species produces very little seed, and relies mostly on vegetative dispersal. "This species rarely if ever sets seed in Britain[4]. "

**Reference(s):**

- Stone, K. R. (2009). *Vinca major*, *V. minor*. In: Fire Effects Information System.
  - TexasInvasives.org (0). Texas Invasives *Vinca major*.
  - Plants For A Future (PFAF) (0). *Vinca major* Greater Periwinkle, Bigleaf periwinkle, Myrtle, Large Periwinkle, Big Periwinkle PFAF Plant Database.
  - 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 / Justification:**

lack of information.

**Reference(s):**

- [Anonymous] .



**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 / Justification:**

lack of information.

**Reference(s):**

- [Anonymous] .
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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 *screeener* has a **High** confidence in this answer based on the available literature.

**Answer / Justification:**

This plant produces very little, if any seed throughout the year.

**Reference(s):**

- Stone, K. R. (2009). *Vinca major*, *V. minor*. In: Fire Effects Information System.
  - Plants For A Future (PFAF) (0). *Vinca major* Greater Periwinkle, Bigleaf periwinkle, Myrtle, Large Periwinkle, Big Periwinkle PFAF Plant Database.
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## 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 *screeners* has a **Medium** confidence in this answer based on the available literature.

#### Answer / Justification:

There is no evidence of this.

#### Reference(s):

- [Anonymous] .
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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 *screeners* has a **Medium** confidence in this answer based on the available literature.

#### Answer / Justification:

If and when a plant produces seeds, they are dispersed by wind. Fragments or cuttings of this plant can also readily spread by water.

#### Reference(s):

- TexasInvasives.org (0). Texas Invasives *Vinca major*.
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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 *screeners* has a **Medium** confidence in this answer based on the available literature.

### Answer / Justification:

There is no evidence of this.

### Reference(s):

- [Anonymous] .
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## Total PRE Score

**PRE Score:** 16 -- Reject (high risk of invasiveness)

**Confidence:** 70 / 100

**Questions answered:** 18 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:

- Eamonn Leonard

December 7, 2017

This evaluation has a total of 1 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](mailto: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](mailto: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.