



***Plant Risk Evaluator -- PRE<sup>TM</sup>  
Evaluation Report***

***Buddleja davidii 'Black Knight' -- Georgia***

*2017 Farm Bill PRE Project*

**PRE Score:** 18 -- Reject (high risk of invasiveness)

**Confidence:** 57 / 100

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

**Privacy:** Public

**Status:** Completed

**Evaluation Date:** May 16, 2017

*This PDF was created on August 13, 2018*



## Plant Evaluated

*Buddleja davidii* 'Black Knight'



Image by Missouri Botanical Garden



## Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Buddleja davidii* 'Black Knight') 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

*Buddleja davidii* 'black night' is unlike the other cultivars screened to date (*Ligustrum sinense* 'sunshine' and *Nandina domestica* 'firepower'). This cultivar differs from the parent species in floral form (color and inflorescence length) ONLY. There is no reduction in fitness and fecundity as seen in the previous two cultivars assessed, and therefore the screening was conducted differently. In this evaluation the screener has primarily used parent species resources, as it is assumed most of the taxonomic and botanical characteristics of the parent species are shared by cultivar (excluding inflorescence length and color.) This is in line with the suggested method for screening cultivars outlined by PRE team members in April. I think the PRE score is indicative of the possible threat this plant poses. This plant should be given consideration before selling, as the parent species has shown to escape easily from garden's and even the most altruistic gardener may not deadhead every bloom or every season to avoid the spread of this prolific grower into natural areas in Georgia. It should be noted that the parent species does NOT appear on the Georgia Exotic Pest Plant Council list of non-native invasive plants, and although *Buddleja lindleyana* has been well documented as invasive, the weediness of *B. davidii* in the southeast is not. Additionally reviewers of this evaluation who have worked with the cultivar have noted that they have "never seen a wild seedling from any cultivar in a nursery or in the wild in the state of Georgia".

## General Information

**Status:** Completed

**Screener:** Kylie Bucalo

**Evaluation Date:** May 16, 2017

## Plant Information

**Plant:** *Buddleja davidii* 'Black Knight'

**If the plant is a cultivar, how does its behavior differ from its parent's?**

*Buddleja davidii* 'blacknight' differs from the parent species in panicle colour and length. The flower color is a dark purple and the panicle is shorter at approximately 15-20 cm length



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

#### Answer / Justification:

CL set to medium, using parent species resource. *B. davidii* is distributed throughout the US and in the UK is recognized as the most common and widely distributed naturalized non-indigenous plant species. CABI resource shows that *Buddleja davidii* has been introduced into countries in Europe, Oceania, South America, Central America and the Caribbean, North America and Africa. It is native to China but has been introduced and reported as invasive in Malaysia. NABA article references USDA and dictates it has been naturalized in over 20 U.S. states.

#### Reference(s):

- CABI (0). *Buddleja davidii* \_ CABI.
- Young-Matthews, A. (2011). Butterfly bush fact sheet \_USDA.
- North American Butterfly Association (2012). The great Butterfly bush debate.

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



**Answer / Justification:**

CL set to medium, using parent species resource. *B. davidii* has been introduced into the southeast U.S with CABI showing the plant as being introduced and invasive in Alabama, Georgia, North Carolina and South Carolina which are all a climate match for the region of concern. Additionally the USDA resource states that *B. davidii* is a list B designated weed in the state of Oregon and is subject to quarantine. As of January 1, 2010, any plant listed as 'butterfly bush' is assumed to be *B. davidii* and is prohibited entry, transport, purchase, sale or propagation in the State of Oregon. Parts of Oregon are a climate match for Georgia. Lastly Tallent and Watt (2009) remark it has been naturalized in Georgia and across the southeast.

**Reference(s):**

- CABI (0). *Buddleja davidii* \_ CABI.
  - Young-Matthews, A. (2011). Butterfly bush fact sheet \_USDA.
  - North American Butterfly Association (2012). The great Butterfly bush debate.
  - Tallent-Halsell, N. G., & Watt M. S. (2009). The Invasive *Buddleja davidii* (Butterfly Bush). *Botanical Review*. 75, 292–325.
- 

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

**Answer / Justification:**

CL set to medium, using parent species resource. *B. davidii* has been introduced into the southeast U.S with CABI showing the plant as being introduced and invasive in Alabama, Georgia, North Carolina and South Carolina which are all a climate match for the region of concern. Internationally the plant has been listed as invasive in the CABI resource in New Zealand, Malaysia, UK, Papua New Guinea, Puerto Rico, and Hawaii. Listed invasive in Alabama, Georgia, North Carolina and South Carolina which are all a climate match for the region of concern. Additionally the USDA resource states that *B. davidii* is a list B designated weed in the state of Oregon and is subject to quarantine. Lastly as of January 1, 2010, any plant listed as 'butterfly bush' is assumed to be *B. davidii* and is prohibited entry, transport, purchase, sale or propagation in the State of Oregon.



**Reference(s):**

- CABI (0). *Buddleja davidii* \_ CABI.
  - Young-Matthews, A. (2011). Butterfly bush fact sheet \_USDA.
  - North American Butterfly Association (2012). The great Butterfly bush debate.
  - Tallent-Halsell, N. G., & Watt M. S. (2009). The Invasive *Buddleja davidii* (Butterfly Bush). *Botanical Review*. 75, 292–325.
- 

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

**Answer / Justification:**

CL set to low. Using parent species resources but finding conflicting information. *B. davidii* has been introduced into the southeast U.S with CABI showing the plant as being introduced and invasive in Alabama, Georgia, North Carolina and South Carolina which are all a climate match for the region of concern. It should be noted that *Buddleja davidii* does not appear on the Georgia Exotic Pest Plant Council list of non-native invasive plants, and additionally a Clemson University resource indicates with the exception of *Buddleja lindleyana* there seems to be no problems with weediness of *B. davidii* in the southeast.

**Reference(s):**

- CABI (0). *Buddleja davidii* \_ CABI.
  - Clemson Cooperative Extension (0). HGIC 1084 Butterfly Bush : Extension : Clemson University : South Carolina.
  - Georgia Exotic Pest Plant Council (0). List of Non-Native Invasive Plants in Georgia - Georgia Exotic Pest Plant Council.
-



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

**Answer / Justification:**

*Buddleja lindleyana* is reported invasive in Florida, Georgia, NC and Texas, some of which are a climate match for the region of concern.

**Reference(s):**

- Plant Conservation Alliance@s Alien Plant Working Group (0). PCA/APWG Distribution Map: Lindley's butterfly bush (*Buddleja lindleyana*).
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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 *screeners* has a **Low** confidence in this answer based on the available literature.





**Answer / Justification:**

Taken from the Tallent and Watt (2009) resource: "The current distribution of *B. davidii* indicates the core distribution to be in warmer humid regions that include temperate, subtropical, and Mediterranean climates. The species does extend into cooler continental climates, but the distribution in these areas is somewhat limited." I would conclude from the U.S distribution map shown within the Tallent and Watt (2009) paper of *B. davidii* that its distribution matches very closely to highlighted regions on the climate match map, with the exclusion of some colder climate areas where *B. davidii* can be found. The domestic distribution match could easily be inferred as predominantly. However this species is widespread and has been introduced to countries in Europe, Oceania, South America, Central America and the Caribbean, and Africa. Using the GBIF distribution map the widespread distribution in New Zealand is a climate match for the region of concern, as is the distribution found in Australia (along the east coast). The distribution in South America is not a climate match, as there are multiple occurrences in the south east which fall out of highlighted areas on the PRE map. Occurrences of *B. davidii* in Europe are extremely dense and hard to separate on the GBIF map, but it is a fair assumption that it is not a complete climate match to the region of concern, because the distribution is so widespread that it reaches out and over far beyond the areas highlighted by the PRE climate matching tool. Lastly none of England or Africa is highlighted as a climate match for the region of concern yet there is widespread distribution of *B. davidii* in both of these areas This answer could swing either way, it's close to 50% however I have scored it a "No" because *B. davidii* has such a widespread distribution globally. I have kept CL to low because it is pretty close.

**Reference(s):**

- CABI (0). *Buddleja davidii* \_ CABI.
- GBIF (0). GBIF distribution \_*Buddleja davidii*.
- Tallent-Halsell, N. G., & Watt M. S. (2009). The Invasive *Buddleja davidii* (Butterfly Bush). *Botanical Review*. 75, 292–325.

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

**Answer / Justification:**

CL set to medium, using parent species resource. Excerpt taken from USDA resource: "It can form dense thickets that out-compete native vegetation"



**Reference(s):**

- Young-Matthews, A. (2011). Butterfly busg fact sheet \_USDA.
- 

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

**Answer / Justification:**

*Buddleja davidii* is not noted as promoting fire or changing fire regimes.

**Reference(s):**

- [Anonymous] .
- 

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

**Answer / Justification:**

Lack of evidence.

**Reference(s):**

- [Anonymous] .
-



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

- 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:

CL set to medium, using parent species resource. Excerpt taken from USDA resource: "It can form dense thickets that out-compete native vegetation"

### Reference(s):

- Young-Matthews, A. (2011). Butterfly busg fact sheet \_USDA.
- 

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

### Answer / Justification:

CL set to medium, using parent species resource. Excerpt from USDA resource "Cut branches must be disposed of properly (burned or composted) to ensure they don't sprout into new plants." and also "This plant establishes readily from seed and stem fragments in disturbed or natural areas."

### Reference(s):

- Young-Matthews, A. (2011). Butterfly busg fact sheet \_USDA.
-



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

**Answer / Justification:**

CL set to medium, using parent species resource. Excerpt from USDA fact sheet "This plant establishes readily from seed and stem fragments in disturbed or natural areas." And "Cut branches must be disposed of properly (burned or composted) to ensure they don't sprout into new plants."

**Reference(s):**

- Young-Matthews, A. (2011). Butterfly busg fact sheet \_USDA.
- 

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

- 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:**

CL set to medium, using parent species resource.

**Reference(s):**

- Young-Matthews, A. (2011). Butterfly busg fact sheet \_USDA.
- 

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

- 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:**

CL set to medium, using parent species resource. Inferred from verbiage given to describe seed produced. Excerpt from CABI resource "capable of prolific seed production." There may be a slight reduction in number of seeds produced in cultivar as it is noted the inflorescence is smaller (15-20 cm panicle compared with up to 30 cm)

**Reference(s):**

- CABI (0). *Buddleja davidii* \_ CABI.
  - Wikipedia (2016). *Buddleja davidii* 'Black Knight'\_ wikipedia.
- 

**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:**

Unknown. Left blank

**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: **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:**

CL set to medium, using parent species resource. Is described as having a "short juvenile period" by the CABI resource, and the USDA resource states seed can be produced in the first year



**Reference(s):**

- Young-Matthews, A. (2011). Butterfly busg fact sheet \_USDA.
  - CABI (0). *Buddleja davidii* \_ CABI.
- 

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

**Answer / Justification:**

CL set to medium, using parent species resource. Yes answer inferred from flowering phenology. Flowers persist from late spring to late fall

**Reference(s):**

- Young-Matthews, A. (2011). Butterfly busg fact sheet \_USDA.
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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:**

no references found for 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:**

CL set to medium, using parent species resource. Excerpt from USDA resource: "Easily spread by wind and water"

**Reference(s):**

- Young-Matthews, A. (2011). Butterfly busg fact sheet \_USDA.
- 

**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] .
-



## Total PRE Score

**PRE Score:** 18 -- Reject (high risk of invasiveness)

**Confidence:** 57 / 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".

$\geq 16$  : valid (80% or more questions answered)

$\leq 15$  : 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:

- John "Doc" Ruter January 9, 2018
- Timothy Daly January 2, 2018
- Eamonn Leonard December 7, 2017
- Brian Jernigan November 20, 2017

This evaluation has a total of 4 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.

### Issue ID # 6282

**Date Created:** January 9, 2018 - 12:32pm

**Date Updated:** February 16, 2018 - 11:29am

**Submitted by:** John "Doc" Ruter

**Status:** Fixed

**Type:** Comment

**Severity:** Major

**Scope:** Evaluation as a whole

### Issue Description

I have done breeding work with this cultivar and it does produce viable seed. However, I have never seen a wild seedling from any cultivar in a nursery or in the wild in the state of Georgia - so extrapolating general information from miscellaneous publications from around the country doesn't work in this case. Even in a garden setting Japanese maple is more of a weed than *B. davidii*. I doubt that vegetation propagation in the wild will be an issue. Other species such as *B. lindleyi* spread aggressively by root sprouts, but not this species.

### Issue Resolution (Screener's Response to Issue)

Question 4 addresses the issues of the reviewer (see below in italics). An additional sentence has been added to the evaluation summary to reflect issues also.

*Q4. "Using parent species resources but finding conflicting information. *B. davidii* has been introduced into the southeast U.S with CABI showing the plant as being introduced and invasive in Alabama, Georgia, North Carolina and South Carolina which are all a climate match for the region of concern. It should be noted that *Buddleja davidii* does not appear on the Georgia Exotic Pest Plant Council list of non-native invasive plants, and additionally a Clemson University resource indicates with the exception of *Buddleja lindleyana* there seems to be no problems with weediness of *B. davidii* in the southeast. "*



**Issue ID # 3355**

**Date Created:** June 2, 2017 - 1:33pm

**Date Updated:** June 22, 2017 - 8:15am

**Submitted by:** Eamonn Leonard

**Status:** Fixed

**Type:**

**Severity:** Minor

**Scope:** Q13. Does the species (or cultivar or variety) commonly produce viable seed?

**Issue Description**

The CL in the text and score above do not match. Assume that a CL of medium was meant for both. The text states CL of medium and above this it is listed as high.

**Issue Resolution (Screener's Response to Issue)**

Matched the CL in the text to the CL in the drop down menu. Accepted revisors comments.

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## **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.