



***Plant Risk Evaluator -- PRETM
Evaluation Report***

Buddleja davidii -- Texas

2017 Farm Bill PRE Project

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

Confidence: 87 / 100

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

Privacy: Public

Status: Completed

Evaluation Date: March 14, 2017

This PDF was created on July 06, 2018



Plant Evaluated

Buddleja davidii



Image by J.S. Peterson



Evaluation Overview

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

General Information

Status: Completed

Screener: Kim Taylor

Evaluation Date: March 14, 2017

Plant Information

Plant: *Buddleja davidii*

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

Answer / Justification:

Naturalized in Australia, New Zealand, Europe, and United States as well as South Africa, Zambia, and Zimbabwe. Peru, Ecuador, Bolivia, Columbia, Panama, and Mexico

Reference(s):

- Tallent-Halsell, N. G., & Watt M. S. (2009). The Invasive *Buddleja davidii* (Butterfly Bush). *Botanical Review*. 75, 292–325.
- U.S. National Plant Germplasm Network (0). Taxonomy - GRIN-Global Web v 1.9.8.2.
- United States Department of Agriculture (2014). USDA-NRCS Plants Database.

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

Answer / Justification:

Naturalized areas with similar climate include Australia, Europe, United States (particularly SE US)



Reference(s):

- U.S. National Plant Germplasm Network (0). Taxonomy - GRIN-Global Web v 1.9.8.2.
 - United States Department of Agriculture (2014). USDA-NRCS Plants Database.
 - 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 *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

noted as noxious weed in Washington and "B" designated weed in Oregon.

Reference(s):

- United States Department of Agriculture (2014). USDA-NRCS Plants Database.
-

4. Is the species (or cultivar or variety) noted as being invasive in the US or world in a similar climate?

- 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:

Invasive in Washington and Oregon but not in similar climate

Reference(s):

- United States Department of Agriculture (2014). USDA-NRCS Plants Database.
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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 *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

B. asiatica and *B. dysophylla* considered invasive in Australia. Several species are naturalized in the US, but not in similar Climates.

Reference(s):

- Tallent-Halsell, N. G., & Watt M. S. (2009). The Invasive *Buddleja davidii* (Butterfly Bush). *Botanical Review*. 75, 292–325.
 - Kartesz, J. T. (2015). The Biota of North America Program (BONAP).
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6. Is the species (or cultivar or variety) found predominately in a climate matching the region of concern?

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

Answer / Justification:

Found in many locations, with varied climates. Most do not match the region.

Reference(s):

- [Anonymous] .
-



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

Answer / Justification:

In New Zealand it quickly displaced primary native colonizers. In UK it did not reveal high levels of intraspecific competition though. Invaded riparian areas in Oregon and Washington and replaced native *Salix* spp. and *Populus* spp. In Canada invaded Garry Oak ecosystems

Reference(s):

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

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:

No evidence found either way

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

Answer / Justification:

No evidence found either way. No toxicity reported and not typically escaped into systems with grazing livestock.

Reference(s):

- Tallent-Halsell, N. G., & Watt M. S. (2009). The Invasive *Buddleja davidii* (Butterfly Bush). *Botanical Review*. 75, 292–325.
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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 *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Can form dense thickets since it is a multi-branched shrub.

Reference(s):

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



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:

can reproduce from broken off pieces

Reference(s):

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

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

Answer / Justification:

can reproduce asexually from stem and root fragments. Observed from buried stems, stumps and roots disturbed during flooding. Also can regenerate from *B. davidii* debris left after removal attempts

Reference(s):

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



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

- 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:

"It is probable that *B. davidii* had escaped earlier than 1935 from gardens because the species seeded freely in gardens and therefore, had the potential for dispersal and establishment outside of the garden"

Reference(s):

- Tallent-Halsell, N. G., & Watt M. S. (2009). The Invasive *Buddleja davidii* (Butterfly Bush). *Botanical Review*. 75, 292–325.
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14. Does this plant produce copious viable seeds each year (> 1000)?

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

Answer / Justification:

a single plant can produce from 100,000 to 3,000,000 seeds each year, depending on the specific cultivar.

Reference(s):

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



15. Is there significant germination (>25%) of seeds the next growing season, with no requirement of an infrequent environmental condition for seeds to germinate (i.e. fire) or long dormancy period?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

seed viability is highest for first 2.5 years. After 3.5 years no viable seed remains. Because of this information, I can infer that over 25% of seeds germinate in first year and the species does not require specific environmental conditions to germinate.

Reference(s):

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

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

Answer / Justification:

begins flowering and setting seeds at about 2 years, and possibly as early as the first year

Reference(s):

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



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

Answer / Justification:

flowers freely on new growth from late spring to mid-autumn in the northern hemisphere and early summer to late summer or mid-autumn in the Southern hemisphere

Reference(s):

- Tallent-Halsell, N. G., & Watt M. S. (2009). The Invasive *Buddleja davidii* (Butterfly Bush). *Botanical Review*. 75, 292–325.
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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 specific adaptations or evidence for animal dispersal. Dispersal appears to be primarily by wind.

Reference(s):

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



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

Answer / Justification:

by water, especially along sea coasts, floodplains, and riparian corridors and can be washed downstream during flood events.

Reference(s):

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

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

Answer / Justification:

dispersed by automobiles and trains as well as machinery, where germinants have been observed in mud stuck to machinery

Reference(s):

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



Total PRE Score

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

Confidence: 87 / 100

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

PRE Score Legend

The PRE Score is calculated by adding the point totals for each (answered) question.

< 13 : accept (low risk of invasiveness)

13 - 15 : evaluate further

> 15 : reject (high risk of invasiveness)

Questions Answered Legend

It is important to answer at least 16 questions to consider a PRE Score as "valid".

>= 16 : valid (80% or more questions answered)

<= 15 : invalid (not enough questions answered)

Organization Ownership and Content Privacy

Organization: 2017 Farm Bill PRE Project

Content Privacy: Public



Evaluation Reviewers

The PRE approach is to base decisions on science and make decisions by consensus of diverse horticultural stakeholders. The literature review and process of answering PRE's questions are based on science; the decisions of which plants to prioritize are based on consensus. To ensure this process is in place and that PRE is collaborative, volunteer stakeholders are recruited from each region to review evaluations. The following experts in their profession (plant science, conservation, or horticultural trade) have participated as volunteer PRE reviewers for this evaluation:

- Hans Landel

December 18, 2017

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 if additional action is required to resolve open issues.

Issue ID # 6162

Date Created: December 18, 2017 - 10:00pm

Date Updated: January 2, 2018 - 1:36pm

Submitted by: Hans Landel

Status: Fixed

Type: Suggestion

Severity: Major

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

Issue Description

No justification provided.

Issue Resolution (Screener's Response to Issue)

Justification added.

Issue ID # 3106

Date Created: May 9, 2017 - 9:28am

Date Updated: January 2, 2018 - 1:36pm

Submitted by: Steve Moore

Status: Fixed

Type: Comment

Severity:



Minor

Scope: General Information

Issue Description

Buddleja davidii hybrids have become a staple of the horticulture and landscape industry in Texas, and they have proven themselves to encourage butterfly populations by providing nectar to adults. I think that more investigation should be done to determine if these hybrids are actually sterile and pose no threat as does the species.

Issue Resolution (Screener's Response to Issue)

I agree that additional work needs to be done to evaluate potentially sterile hybrids and cultivars. This evaluation only concerns the parent species though so no changes have been made.



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.