



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

***Pentaglottis sempervirens -- California***

*University of California Agriculture and Natural Resources*

**PRE Score:** 10 -- Low Potential Risk

**Confidence:** 55 / 100

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

**Privacy:** Public

**Status:** Completed

**Evaluation Date:** June 11, 2021

*This PDF was created on May 16, 2024*

*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

*Pentaglottis sempervirens*



Image by Gerald Carr



## Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Pentaglottis sempervirens*) 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

*Pentaglottis sempervirens* (green alkanet) is a medium sized perennial (up to 3 ft. tall) native to western Europe and can remain green all winter provided it does not freeze. The plant grows in shady areas in woodlands, gardens and also roadsides, but can also tolerate full sun. It produces a bright blue flower, that some sources suggest is edible. The leaves are hairy and can cause irritation. The plant appears to spread in gardens and can become weedy in disturbed soils (such as roadsides and gardens). The plant has a long perennial taproot, from which it can re-sprout making control of individual established plants difficult when using hand tools. *Pentaglottis sempervirens* has become naturalized in the UK as well as California, Oregon, Washington, British Columbia, Australia and New Zealand. Gardeners in the U.K. report it being invasive, both in the garden and also in woodlots. Reports of it being invasive outside of the U.K. are minimal.

## General Information

**Status:** Completed

**Screener:** Chris McDonald

**Evaluation Date:** June 11, 2021

## Plant Information

**Plant:** *Pentaglottis sempervirens*

## Regional Information

**Region Name:** California



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

#### Answer / Justification:

This species' home range is western Europe, excluding the U.K. It is currently found in the U.K., New Zealand, Tasmania and south eastern Australia, and western North America where it is not native.

#### Reference(s):

- Rolfe, J. (2008). New exotic plant records and range extensions for naturalised plants in the southern North Island. Wellington Botanical Society Bulletin.

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

#### Answer / Justification:

Climate matching map shows climate overlap with naturalized range in California with current known points in Oregon, Tasmania and New Zealand.



**Reference(s):**

- GBIF—the Global Biodiversity Information Facility (0). GBIF.
- 

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

**Answer / Justification:**

Native Plant Society, Emerald Chapter, of Oregon lists as invasive. Noted as invasive by Botanical Society of Britain and Ireland. Noted as a watch species by the Washington State Noxious Weed Control board. No formal government agencies list the species as invasive, as of this writing.

**Reference(s):**

- [Anonymous] (2019). Oregon Noxious Weeds.
  - BSBI (Botanical Society of Britain and Ireland) (0). Distribution Map -Pentaglottis Sempervirens.
  - [Anonymous] (2021). Green Alkanet- Washington State Noxious Weed Control Board.
- 

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

**Answer / Justification:**

No reports of this species being invasive in climate areas that match California. It is invasive in the U.K., where climate does not match. There are reports of it spreading, such as in New Zealand, but there doesn't seem to be information describing that spread as invasive (causing damage) and it is spreading in New Zealand where the climate is not a match.



**Reference(s):**

- The Royal Horticultural Society (2021). *Pentaglottis sempervirens* green alkanet.
  - Rolfe, J. (2008). New exotic plant records and range extensions for naturalised plants in the southern North Island. Wellington Botanical Society Bulletin.
  - [Anonymous] (2013). *Pentaglottis sempervirens* (Green Alkanet) again. BSBI (Botanical Society of the British Isles) News.
  - [Anonymous] (2021). Green Alkanet- Washington State Noxious Weed Control Board.
- 

**5. Are other species of the same genus (or closely related genera) invasive in a similar climate?**

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

**Answer / Justification:**

*Pentaglottis sempervirens* is a monotypic genus. Some species in *Anchusa* are present in the US, including in California, Oregon and Washington. *Anchusa officinalis* is listed as invasive in Washington. *Anchusa azure* is listed as invasive in Oregon. *Anchusa* should be a closely related genus (*Anchusa* is a synonym for *Pentaglottis* and both are in the Boragininae subtribe of Boraginaceae)

**Reference(s):**

- [Anonymous] (0). Pacific Northwest Noxious Weed Lists.
  - [Anonymous] (0). Emerald Chapter, Native Plant Society of Oregon.
- 

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



**Answer / Justification:**

While this species is found throughout the northern Iberian peninsula, where the climate matches that of California, the preponderance of locations where this species is found (western and northern Europe) does not match the climate of California.

**Reference(s):**

- GBIF—the Global Biodiversity Information Facility (0). 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: **No**, which contributes **0** point(s) to the total PRE score.
- The *screeners* has a **Medium** confidence in this answer based on the available literature.

**Answer / Justification:**

There is not enough info that it overtops or dominates vegetation where it has established. It appears to be spreading in the UK where it outcompetes garden vegetation and vegetation in wildlands too. It appears to be spreading in natural areas in Oregon, but not displacing native vegetation

**Reference(s):**

- Royal Horticultural Society (2021). Green alkanet.
- 

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





**Answer / Justification:**

It appears to stay green all year, and grows in wet often forested places, thus the plant should produce limited amounts of dry fuels and the fire risk should be low.

**Reference(s):**

- Perrone, J. (2020). Green Alkanet, That Mystery Plant.
  - [Anonymous] (2021). Green Alkanet- Washington State Noxious Weed Control Board.
- 

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

**Answer / Justification:**

The leaves are hairy and some gardeners report it causes irritation. Irritation is not enough to justify yes for toxic Minimal information on effects on livestock grazing. Closely related plants contain alkaloids.

**Reference(s):**

- [Anonymous] .
- 

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

**Answer / Justification:**

The plant only grows 2-3 ft. (1 m) tall, it does not grow tall enough to create impenetrable thickets.



**Reference(s):**

- [Anonymous] .
- 

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

**Answer / Justification:**

The plant has a deep tap root and when severed it can re-sprout, but this is not a form of vegetative reproduction, thus no answer.

**Reference(s):**

- The Royal Horticultural Society (2021). *Pentaglottis sempervirens* green alkanet.
- 

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

**Answer / Justification:**

Sources do not mention that pieces of tap root commonly are moved around. Tap root fragment seem to be deep and not likely to be transported regularly.

**Reference(s):**

- [Anonymous] (2021). Green Alkanet- Washington State Noxious Weed Control Board.



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

**Answer / Justification:**

Produces seeds

**Reference(s):**

- [Anonymous] (2021). Green Alkanet- Washington State Noxious Weed Control Board.
- 

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

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

**Answer / Justification:**

Each flower produces 4 seeds. It is difficult to tell from pictures on the internet if large plants can produce more than 250 flowers per plant. A large plant could be capable of producing over 1,000 seeds, but it is difficult to tell given current resources, unless a picture is found where the flowers can be easily counted on a single plant.

**Reference(s):**

- Perrone, J. (2020). Green Alkanet, That Mystery Plant.
  - [Anonymous] (2021). Green Alkanet- Washington State Noxious Weed Control Board.
-



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

**Answer / Justification:**

Gardeners report that it is easy to grow in gardens in the UK. Several gardening resources also show that it easily seeds each subsequent spring and suggest that it self seeds to the point of being a "nuisance". This seems to support that a significant number of seeds germinate each year, however no formal studies have been conducted only anecdotal observations by gardeners.

**Reference(s):**

- Royal Horticultural Society (2021). Green alkanet.
  - Plants For A Future (PFAF) (0). Plants for a future, *Pentaglottis sempervirens*.
- 

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

**Answer / Justification:**

Reaches full size in 2 years. Many of the pictures on iNaturalist and gardening websites seem to show that full size plants can flower and thus are likely to produce viable seed. However, there does not seem to be a reliable account of how quickly it sets seed. It seems quite reasonable that it can seed within 3 years based on plant growth. Confidence medium.

**Reference(s):**

- Royal Horticultural Society (2021). Green alkanet.
- [Anonymous] (0). Shoot Gardening *Pentaglottis sempervirens*.



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

**Answer / Justification:**

No published information for California or Western US. Flowers from spring through summer, in U.K. and it produces flowers as it grows. New Zealand Flora shows a blowing period of 4 months. It is difficult to confirm flowering season in North America, however iNaturalist observations from western North America show pictures of flowering plants from April to August.

**Reference(s):**

- [Anonymous] (2021). Green Alkanet- Washington State Noxious Weed Control Board.
  - Royal Horticultural Society (2021). Green alkanet.
  - nzflora (0). New Zealand Flora.
  - [Anonymous] (2021). iNaturalist Observations.
- 

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

**Answer / Justification:**

Unknown. Some gardeners suggest seeds can get carried in pet fur. Seed has an elaiosome for ant dispersal.



**Reference(s):**

- Stuessi, H. (0). Picture of seeds with elaiosomes (including *Pentaglottis sempervirens*).
  - Royal Horticultural Society (2021). Green alkanet.
- 

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

**Answer / Justification:**

Unknown, very little information on dispersal outside of gardens. The seeds (nutlets) are relatively large and do not have adaptations for wind or water dispersal. The bracts that surround the nutlet do not seem to have adaptations for wind or water dispersal either, they are covered in prickly hairs.

**Reference(s):**

- [Anonymous] .
- 

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

**Answer / Justification:**

Unknown, very little information outside of dispersal in gardens. No morphological adaptation to suggest long-distance dispersals (no hairs, hooks, bristles, fleshy fruit). However the seed does have an elaiosome, which usually indicates dispersal by ants.



### Reference(s):

- Stuessi, H. (0). Picture of seeds with elaiosomes (including *Pentaglottis sempervirens*).
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## Evaluation Notes

Information on dispersal and invasability in natural areas not well documented. For example in the UK, the plant was introduced in the 1700's however many records of the plant are from after 2010. Which could indicate it is spreading or it is popular with gardeners. Very few ecological studies on this species, the few studies consist of surveys of areas in Europe where this plant was found.

<https://bsbi.org/maps?taxonid=2cd4p9h.ccv#style=N4IgzgpgTglhYgFwG1QAcCGUAuNcHsA7BRUAEw2wgGMAbDME1EACxjLlkKWygFcIAXwA0oNhy49+Q0a3aduiXgJFj5kpdNVyJi5TLW6pK4YT61ap87QC6gwXaA>

## Total PRE Score

**PRE Score:** 10 -- Low Potential Risk

**Confidence:** 55 / 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:** University of California Agriculture and Natural Resources

**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:

- |                    |                  |
|--------------------|------------------|
| • Scott Oneto      | February 4, 2022 |
| • Marie Jasieniuk  | January 3, 2022  |
| • Jutta Burger     | October 10, 2021 |
| • PRE Data Manager | July 14, 2021    |
| • Chris McDonald   | June 29, 2021    |

This evaluation has a total of 5 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](mailto:info@plantright.org) if additional action is required to resolve open issues.

### Issue ID # 7549

**Date Created:** November 10, 2021 - 11:19am

**Date Updated:** December 9, 2021 - 5:33pm

**Submitted by:** Jutta Burger

**Status:** Fixed

**Type:** Suggestion

**Severity:** Minor

**Scope:** Q19. Are the plant's propagules frequently dispersed long distance (>100 m) by wind or water?

#### Issue Description

A scientific or botanical reference is needed to support the answer. – Marie Jasieniuk

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

Added information that it is likely not wind or water dispersed based on plant's biology.

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### Issue ID # 7548

**Date Created:** November 10, 2021 - 11:18am

**Date Updated:** December 10, 2021 - 9:56am

**Submitted by:** Jutta Burger

**Status:** Fixed

**Type:** Suggestion

**Severity:**



Minor

**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

Stronger evidence is needed. Just because the plant reaches full size in 2 years does not guarantee that it will produce viable seed within two years. - Marie Jasieniuk

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

Lowered confidence to medium and added justification that based on gardening accounts and pictures it appears a plant can reach full size in 3 years or less and that full size plants have flowers and it is likely that mature seeds are present in 3 years. But lacking data to fully support the claim.

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#### Issue ID # 7547

**Date Created:** November 10, 2021 - 11:17am

**Date Updated:** December 9, 2021 - 4:47pm

**Submitted by:** Jutta Burger

**Status:** Fixed

**Type:** Suggestion

**Severity:** Minor

**Scope:** Q15. 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?

#### Issue Description

The answer is highly speculative and needs additional information. -Marie Jasieniuk

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

Added an additional citation and expanded that self seeding is prolific but evidence is anecdotal.

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## Issue ID # 7546

**Date Created:** November 10, 2021 - 11:17am

**Date Updated:** December 9, 2021 - 4:42pm

**Submitted by:** Jutta Burger

**Status:** Fixed

**Type:** Suggestion

**Severity:** Minor

**Scope:** Q14. Does this plant produce copious viable seeds each year (>1000)?

### Issue Description

More information about the biology is needed to support the answer. The answer states that it is not tall enough but a dense infestation of a 3 ft plant could be impenetrable slowing or blocking movement of humans or animals, couldn't it? – Marie Jasieniuk

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

Added more information that given most pictures on the internet it is difficult to tell if the species can produce 1,000 seeds per plant. Most pictures show close ups of flowers or thick patches. Answer still remains a no (very low confidence) due to lack of evidence.

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## Issue ID # 7545

**Date Created:** November 10, 2021 - 11:16am

**Date Updated:** December 9, 2021 - 3:51pm

**Submitted by:** Jutta Burger

**Status:** Fixed

**Type:** Suggestion

**Severity:** Minor

**Scope:** Q08. Is the plant noted as promoting fire and/or changing fire regimes?



### Issue Description

More information about the biology or habitat of the species is needed to support the answer. – Marie Jasieniuk

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

Added that it grows in wet places and plant does not produce much dry fuel.

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### Issue ID # 7544

**Date Created:** November 10, 2021 - 11:15am

**Date Updated:** December 9, 2021 - 3:28pm

**Submitted by:** Jutta Burger

**Status:** Fixed

**Type:** Suggestion

**Severity:** Minor

**Scope:** Q01. Has the species (or cultivar or variety, if applicable) become naturalized where it is not native?

### Issue Description

State where the species is native. Add reference to support statement that species is naturalized in western North America (NA). One possibility is: <https://www.pnwherbaria.org/>

– Marie Jasieniuk

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

Added this species is native to W. Europe. Q3 has a citation for it being invasive in Oregon.

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### Issue ID # 7466



**Date Created:** October 22, 2021 - 2:43pm

**Date Updated:** December 9, 2021 - 3:51pm

**Submitted by:** Marie Jasieniuk

**Status:** Fixed

**Type:** Suggestion

**Severity:** Minor

**Scope:** Q08. Is the plant noted as promoting fire and/or changing fire regimes?

### Issue Description

More information about the biology or habitat of the species is needed to support the answer. - Marie Jasieniuk

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

Added that it grows in wet places and plant does not produce much dry fuel.

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## Issue ID # 7465

**Date Created:** October 22, 2021 - 2:40pm

**Date Updated:** December 9, 2021 - 3:22pm

**Submitted by:** Marie Jasieniuk

**Status:** Fixed

**Type:** Suggestion

**Severity:** Major

**Scope:** Q01. Has the species (or cultivar or variety, if applicable) become naturalized where it is not native?

### Issue Description

State where the species is native. Add reference to support the statement that the species is naturalized in western North America. One possibility is: <https://www.pnwherbaria.org/> - Marie Jasieniuk

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



Added that it is native to western Europe.

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## Issue ID # 7336

**Date Created:** October 10, 2021 - 8:10pm

**Date Updated:** December 9, 2021 - 5:38pm

**Submitted by:** Jutta Burger

**Status:** Fixed

**Type:** Suggestion

**Severity:** Major

**Scope:** Q17. Does this plant continuously produce seed for >3 months each year or does seed production occur more than once a year?

### Issue Description

If there is evidence that this plant blooms for 4+ months of the year and set seed throughout that time, then this may be a "yes".

See Tony's reference:

Fern, K. (2021). [Pentaglottis sempervirens - Useful Temperate Plants](#).

**-Jutta Burger**

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

Changed answer to yes, several sources seem to suggest it can bloom for more than 3 months. The most significant of which was the iNaturalist observations in W. N. America show observations for 4 months with flowers. However published evidence is lacking.

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## Issue ID # 7335



**Date Created:** October 10, 2021 - 8:08pm

**Date Updated:** December 9, 2021 - 4:48pm

**Submitted by:** Jutta Burger

**Status:** Fixed

**Type:** Suggestion

**Severity:** Minor

**Scope:** Q15. 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?

### Issue Description

Match answer better to question. If there are reports from garden societies that this plant is sprouting prolifically, then that is enough (w ref). - Jutta Burger

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

Added an additional citation and expanded that gardeners report self seeding is prolific but evidence is anecdotal.

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## Issue ID # 7334

**Date Created:** October 10, 2021 - 8:06pm

**Date Updated:** December 9, 2021 - 4:42pm

**Submitted by:** Jutta Burger

**Status:** Fixed

**Type:** Comment

**Severity:** Minor

**Scope:** Q14. Does this plant produce copious viable seeds each year (>1000)?

### Issue Description

Provide some botanical reference. - Jutta Burger

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





Added more information and a citation that given most pictures on the internet it is difficult to tell if the species can produce 1,000 seeds per plant. Most pictures show close ups of flowers or thick patches. Answer still remains a no (very low confidence) due to lack of evidence.

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### Issue ID # 7333

**Date Created:** October 10, 2021 - 8:04pm

**Date Updated:** December 9, 2021 - 3:51pm

**Submitted by:** Jutta Burger

**Status:** Fixed

**Type:** Suggestion

**Severity:** Minor

**Scope:** Q08. Is the plant noted as promoting fire and/or changing fire regimes?

### Issue Description

Provide (botanical) reference for information provided. - Jutta Burger

### Issue Resolution (Screeners' Response to Issue)

Added that it grows in wet places and plant does not produce much dry fuel and added citations

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### Issue ID # 7332

**Date Created:** October 10, 2021 - 8:03pm

**Date Updated:** December 9, 2021 - 3:45pm

**Submitted by:** Jutta Burger

**Status:** Fixed

**Type:** Comment

**Severity:** Minor



**Scope:** Q05. Are other species of the same genus invasive in a similar climate?

**Issue Description**

Good to mention that Pentaglottis was once part of Anchusa. - Jutta Burger

**Issue Resolution**

No resolution has been entered for this issue.

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**Issue ID # 7331**

**Date Created:** October 10, 2021 - 8:00pm

**Date Updated:** December 9, 2021 - 3:45pm

**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**

Make sure this answer syncs with that for #3. - Jutta Burger

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

Yes answer is consistent

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**Issue ID # 7330**

**Date Created:** October 10, 2021 - 7:58pm



**Date Updated:** December 9, 2021 - 3:36pm

**Submitted by:** Jutta Burger

**Status:** Fixed

**Type:** Suggestion

**Severity:** Minor

**Scope:** Q03. Is the species (or cultivar or variety) noted as being invasive in the U.S. or world?

### Issue Description

The references that you provide are not strong enough to support "very high". I'm actually not seeing anywhere that it is clearly identified as invasive by a more formal organization (other than the Oregon Native Plant Soc). Washington only lists it as a "monitor" species. Consider at most a "medium" confidence and perhaps even a "no" w "low" confidence (depending on if you dig anything else up). - Jutta Burger

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

Changed confidence to medium added note that no formal agency lists as invasive yet.

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## Issue ID # 7329

**Date Created:** October 10, 2021 - 7:54pm

**Date Updated:** December 9, 2021 - 3:29pm

**Submitted by:** Jutta Burger

**Status:** Fixed

**Type:** Suggestion

**Severity:** Minor

**Scope:** Q01. Has the species (or cultivar or variety, if applicable) become naturalized where it is not native?

### Issue Description

Mention where it is native. - Jutta Burger

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



Added it is native to Europe

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### Issue ID # 6658

**Date Created:** July 12, 2021 - 10:12am

**Date Updated:** December 9, 2021 - 5:07pm

**Submitted by:** Alex Simmons

**Status:** Fixed

**Type:** Suggestion

**Severity:** Minor

**Scope:** Q17. Does this plant continuously produce seed for >3 months each year or does seed production occur more than once a year?

### Issue Description

Maybe add a CA based reference for this as flowering times may be different geographically. Calflora is a good source for this. (Alex Stubblefield)

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

No California or western US sources provide information on this question, answered no. Found a reference from NZ that says a 4 month flowering window but cannot confirm. Also found locations in iNaturalist that show a 4 month flowering window.

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### Issue ID # 6657

**Date Created:** July 12, 2021 - 10:11am

**Date Updated:** August 5, 2021 - 11:00am

**Submitted by:** Alex Simmons

**Status:** Fixed



**Type:** Suggestion

**Severity:** Minor

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

### Issue Description

Please provide reference(s) and/or state if this is from personal observation. Any evidence that the seed is viable (e.g. from horticultural trade, Kew)? (Alex Stubblefield)

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

Added citation

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### Issue ID # 6656

**Date Created:** July 12, 2021 - 10:10am

**Date Updated:** August 5, 2021 - 10:59am

**Submitted by:** Alex Simmons

**Status:** Fixed

**Type:** Suggestion

**Severity:** Minor

**Scope:** Q12. If naturally detached fragments from this plant are capable of producing new plants, is this a common method of reproduction for the plant?

### Issue Description

Please provide reference(s) and/or state if this is from personal observation. (Alex Stubblefield)

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

Added citation

---



## Issue ID # 6655

**Date Created:** July 12, 2021 - 10:09am

**Date Updated:** August 5, 2021 - 10:53am

**Submitted by:** Alex Simmons

**Status:** Fixed

**Type:** Suggestion

**Severity:** Minor

**Scope:** Q11. Does this species (or cultivar or variety) reproduce and spread vegetatively?

### Issue Description

Please provide reference(s) and/or state if this is from personal observation. (Alex Stubblefield)

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

Added a reference for tap root sprouting.

---

## Issue ID # 6654

**Date Created:** July 12, 2021 - 10:07am

**Date Updated:** August 5, 2021 - 10:49am

**Submitted by:** Alex Simmons

**Status:** Fixed

**Type:** Suggestion

**Severity:** Minor

**Scope:** Q10. Does the plant produce impenetrable thickets, blocking or slowing movement of animals, livestock, or humans?

### Issue Description

Can this be answered by using the biology of the plant to infer the answer? (i.e. size & height of the plant?) (Alex Stubblefield)

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



Used information on height of plant to infer it does not block animal movement

---

### Issue ID # 6653

**Date Created:** July 12, 2021 - 10:06am

**Date Updated:** August 5, 2021 - 10:44am

**Submitted by:** Alex Simmons

**Status:** Fixed

**Type:** Suggestion

**Severity:** Minor

**Scope:** Q06. Is the species found predominately in a climate matching the region of concern?

### Issue Description

Is that where the predominant number of occurrences are? Be sure to list the balance of occurrences that match and do not match. (Alex Stubblefield)

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

Changed to no. The majority of locations for this species do not match the climate of California.

---

### Issue ID # 6652

**Date Created:** July 12, 2021 - 10:03am

**Date Updated:** August 5, 2021 - 11:46am

**Submitted by:** Alex Simmons

**Status:** Fixed

**Type:** Suggestion

**Severity:** Major

**Scope:** Evaluation as a whole



### Issue Description

Use reference widget for citations. (Alex Stubblefield)

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

Added all references to widget and added references to questions throughout.

---

### Issue ID # 6651

**Date Created:** July 12, 2021 - 10:02am

**Date Updated:** August 5, 2021 - 9:55am

**Submitted by:** Alex Simmons

**Status:** Fixed

**Type:** Suggestion

**Severity:** Major

**Scope:** Evaluation as a whole

### Issue Description

Add Climate Match Map. (Alex Stubblefield)

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

Added correct link. Uploaded PDF of CA climate map.

---

### Issue ID # 6650

**Date Created:** July 12, 2021 - 10:01am

**Date Updated:** August 5, 2021 - 10:31am

**Submitted by:** Alex Simmons





**Status:** Fixed

**Type:** Suggestion

**Severity:** Major

**Scope:** Evaluation as a whole

### Issue Description

Add evaluation summary. (Alex Stubblefield)

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

Added a paragraph in the evaluation summary section

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### Issue ID # 6597

**Date Created:** July 11, 2021 - 8:00pm

**Date Updated:** August 5, 2021 - 11:19am

**Submitted by:** Lynn Sweet

**Status:** Fixed

**Type:** Comment

**Severity:** Minor

**Scope:** Q20. Are the plant's propagules frequently dispersed via contaminated seed, equipment, vehicles, boats or clothing/shoes?

### Issue Description

Mention that no morphological evidence supports this either.

-Lynn Sweet

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

Added sentence about morphology of seeds not assisting with dispersal. Added picture of seeds showing morphology and likely ant dispersal.

---



## Issue ID # 6596

**Date Created:** July 11, 2021 - 7:59pm

**Date Updated:** August 5, 2021 - 9:49am

**Submitted by:** Lynn Sweet

**Status:** Fixed

**Type:** Suggestion

**Severity:** Major

**Scope:** Q09. Is the plant a health risk to humans or animals/fish? Has the species been noted as impacting grazing systems?

### Issue Description

Needs to really be medically significant for a "yes" answer. Good information provided, however.

-Lynn Sweet

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

Re-read qualifications, irritation is not medically significant. Unknown if plant contains alkaloids.

---

## Issue ID # 6595

**Date Created:** July 11, 2021 - 7:59pm

**Date Updated:** August 5, 2021 - 9:27am

**Submitted by:** Lynn Sweet

**Status:** Fixed

**Type:** Suggestion

**Severity:** Major

**Scope:** Q07. Does this plant displace native plants and dominate the plant community in areas where it has been established?

### Issue Description



Not enough evidence here in the source cited for dominating/overtopping vegetation in the wild (garden info helpful for context, but not what we can use).

-Lynn Sweet

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

Changes Q7 to NO.

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#### **Issue ID # 6594**

**Date Created:** July 11, 2021 - 7:58pm

**Date Updated:** August 5, 2021 - 10:36am

**Submitted by:** Lynn Sweet

**Status:** Fixed

**Type:** Suggestion

**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**

If "few" means that evidence exists, please list and cite the reports. If there are no reports, then you are correct to indicate "no." Phrasing just a little confusing here.

-Lynn Sweet

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

Clarified language from "few" to "no". No reports of it being invasive (causing harm) in similar climate areas of California.

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## Issue ID # 6593

**Date Created:** July 11, 2021 - 7:57pm

**Date Updated:** July 11, 2021 - 7:57pm

**Submitted by:** Lynn Sweet

**Status:** Fixed

**Type:** Comment

**Severity:** Minor

**Scope:** Evaluation as a whole

### Issue Description

This is OK given the guidance presented, however, evidence of invasiveness OR an authority might be recommended going forward.

- Lynn Sweet

### Issue Resolution

No resolution has been entered for this issue.



## **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](mailto: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.