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

# *Pentaglottis sempervirens* -- Oregon

*2021 Western IPM Grant Project*

**PRE Score:** 8 -- Low Potential Risk
**Confidence:** 63 / 100
**Questions answered:** 20 of 20 -- Valid (80% or more questions answered)

**Privacy:** Public
**Status:** Completed

**Evaluation Date:** June 13, 2021

*This PDF was created on October 26, 2022*

*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, also known as evergreen bugloss and evergreen alkanet, are native to southwest Europe and have become naturalized in similar climates such as Oregon, Washington, Great Britain, Czechoslovakia, and Ireland. This species is currently on the monitor list in Washington and Oregon and is presently not considered an invasive species in Oregon. This species can be difficult to remove after establishment due to a large deep taproot capable of regrowth from remaining fragments. Reproduction is by seeding seasonally, four nutlets per flower, propagules dispersed from parent plant do not exceed >100 meters. This perennial grows approximately 3.3 feet and does not create barriers to migrating species. Pentaglottis sempervirens PRE score of 8 puts this species at the low potential risk of becoming invasive in Oregon.

## General Information

**Status:** Completed
**Screener:** Tony Lind
**Evaluation Date:** June 13, 2021

## Plant Information

**Plant:** *Pentaglottis sempervirens*

## Regional Information

**Region Name:** Oregon

## 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.

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

**Answer / Justification:**

Pentaglottis sempervirensis is native to SW Europe from central Portugal to SW France and has been introduced and naturalized in the NW United States, Great Britain, Czechoslovakia, Italy, and Ireland (Anderson & Zehnder, n.d.; Pentaglottis Tausch | Plants of the World Online | Kew Science, n.d.; Sell & Murrell, 2009).

**Reference(s):**


- Sell, P., & Murrell G. (2009). Flora of Great Britain and Ireland: Volume 3, Mimosaceae - Lentibulariaceae.
- Anderson, S., & Zehnder J. (2016). Bureau of Planning and Sustainability. 202.
- [Anonymous] (0). Pentaglottis sempervirens (L.) Tausch ex L.H.Bailey \textbar Plants of the World Online \textbar Kew Science.


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

**Answer / Justification:**

When comparing the occurrences in the georeferencing map to the similar climate map of Oregon, this species is noted as being naturalized in a similar climate to Oregon. This species has naturalized in Belgium, France, United Kingdom, Australia, Denmark, Czechia, Ireland, Germany, Norway, and the US. Pentaglottis sempervirens have become naturalized in the northwest from southern Oregon up into British Columbia and recorded the Consortium of Pacific Northwest Herbaria map (CPNWH, 2021).

**Reference(s):**


- [Anonymous] (0). GBIF.
- [Anonymous] (0). CPNWH search result .


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## 3. Is the species (or cultivar or variety) noted as being invasive in the U.S. or world?

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

**Answer / Justification:**

Pentaglottis sempervirens is currently on the monitor list in Oregon and Washington; however, many sittings have been reported, and it is known for being invasive (Global Biodiversity Information Facility (GBIF), 2021). This species has naturalized in Great Britain, Czechoslovakia, Italy, and Ireland. This species has a deep taproot and has the potential for environmental effects such as nutrient movement from shallow-rooted plants; however, no economic or environmental damage has been noted (Sell and Murrell 2009).

**Reference(s):**


- Sell, P., & Murrell G. (2009). Flora of Great Britain and Ireland: Volume 3, Mimosaceae - Lentibulariaceae.


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

**Answer / Justification:**

Species Pentaglottis sempervirens have been naturalized in many locations with similar climates; however, no economic or environmental damage has been noted (Randall 2017).

**Reference(s):**


- Randall, R. Peter (2017). A Global Compendium of Weeds. Third Edition..


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

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

**Answer / Justification:**

Three species within the same family (Anchusa officinalis L., Cynoglossum officinale L., and Echium plantagineum L.) are considered invasive and are noted on the Oregon and Washington noxious weed list ("Oregon Noxious Weeds," 2018; "PlantRight," 2017). However, they are not closely related to the genera of Pentaglottis sempervirens.

**Reference(s):**


- [Anonymous] (2019). Oregon Noxious Weeds.
- [Anonymous] (2017). Invasive Plant List – PlantRight.


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

**Answer / Justification:**

About 50% of the area where this species grows has a similar climate to Oregon's climate. The native and naturalized areas are similar to Oregon's climate, such as Ireland, Italy, and Western Europe.

**Reference(s):**


- [Anonymous] (2020). ArcGIS - World Terrestrial Ecosystems.
- [Anonymous] (0). 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: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

**Answer / Justification:**

The Pentaglottis sempervirens are mesophytic found in semi-shaded areas under trees, open fields, and roadsides (Selvi and Bigazzi, 2001). No noted evidence has been found of displacement to native plants.

**Reference(s):**


- Selvi, F., & Bigazzi M. (2001). Leaf surface and anatomy in Boraginaceae tribe Boragineae with respect to ecology and taxonomy. Flora. 196, 269–285.


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

**Answer / Justification:**

This species gets to a height of 3.3 feet and has a deep taproot, and no evidence was found indicating the possibility of promoting fire or changing fire regimes (Pentaglottis Sempervirens | Green Alkanet/RHS Gardening, 2021.).

**Reference(s):**


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


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

**Answer / Justification:**

The species Pentaglottis sempervirens is not known to be toxic or poses a health risk to animals or fish (“Washington State Noxious Weed Control Board,” 2015). However, the trichomes found on the stems and leaves of this species cause skin irritations, similar to stinging nettles (Urtica dioica).

**Reference(s):**


- Washington (2015). Washington State Noxious Weed Control Board.


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

**Answer / Justification:**

This species grows to a height of two to three feet and does not grow in high density great enough to create a deterrent to grazing animals (“Washington State Noxious Weed Control Board,” 2015).

**Reference(s):**


- Washington (2015). Washington State Noxious Weed Control Board.


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

**Answer / Justification:**

Pentaglottis s. is known for having a deep taproot that any fragments will resprout if not entirely removed. However, no information was found on reproduction vegetatively only by seeding ("Pentaglottis Tausch | Plants of the World Online | Kew Science," n.d.; "Washington State Noxious Weed Control Board," 2015).

**Reference(s):**


- [Anonymous] (0). Pentaglottis Tausch \textbar Plants of the World Online \textbar Kew Science.
- Washington (2015). Washington State Noxious Weed Control Board.


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

**Answer / Justification:**

This species reproduces four nutlets in each flower ("Washington State Noxious Weed Control Board," 2015). This species has a deep large tap root, and any fragments left after removal will resprout as the original plant.

**Reference(s):**

- Washington (2015). Washington State Noxious Weed Control Board.

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

**Answer / Justification:**

Pentaglottis sempervirens commonly produce viable seeds, four seeds as nutlets per flower (Sell and Murrell 2009; “Oregon Noxious Weeds” 2018; “Pentaglottis Sempervirens (L.) Tausch Ex L.H.Bailey | Plants of the World Online | Kew Science” n.d.; “Washington State Noxious Weed Control Board” n.d.)

**Reference(s):**

- Washington (2015). Washington State Noxious Weed Control Board.
- Sell, P., & Murrell G. (2009). Flora of Great Britain and Ireland: Volume 3, Mimosaceae - Lentibulariaceae.
- [Anonymous] (2019). Oregon Noxious Weeds.
- [Anonymous] (0). Pentaglottis sempervirens (L.) Tausch ex L.H.Bailey \textbar Plants of the World Online \textbar Kew Science.

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

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

**Answer / Justification:**

This species has four seeds per flower and not enough flowers to produce substantial numbers producing

**Reference(s):**


- [Anonymous] (0). Pentaglottis Tausch \textbar Plants of the World Online \textbar Kew Science.
- Washington (2015). Washington State Noxious Weed Control Board.


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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: **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:**

This species has been noted to invade garden environments by dormant seeds, likely greater than 25% (CPNWH Search Results, 2021).

**Reference(s):**


- [Anonymous] (0). CPNWH search result .


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

**Answer / Justification:**

This species is a perennial plant that produces viable seeds each year from spring through summer (Sell & Murrell, 2009) and can grow to maximum height within two years (RHS gardening, 2021). The information found does not specifically state seeding within three years. However, this species likely seeds within three years.

**Reference(s):**


- Sell, P., & Murrell G. (2009). Flora of Great Britain and Ireland: Volume 3, Mimosaceae - Lentibulariaceae.
- The Royal Horticultural Society (2021). Pentaglottis sempervirens green alkanet.


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

**Answer / Justification:**

This species starts to flower in April and continues through July, producing four nutlet seeds per flower, indicating seeding greater than three months (Fern 2021).

**Reference(s):**


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


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

**Answer / Justification:**

Pentaglottis sempervirens seeds appear smooth without any appendages such as barbs, hooks, or flaps that are usually observed on seeds that disperse long-distance by wind, water, or animals (Weigend et al. 2010). The nutlets produced by the Pentaglottis sempervirens are similar to a related species Achusa that seeds dispersed through myrmecochory. However, the distance through myrmecochory is still less than 100 meters (Quilichini and Debussche 2000).

**Reference(s):**


- Weigend, M., Gottschling M., Selvi F., & Hilger H. (2010). Fossil and Extant Western Hemisphere Boragineae, and the Polyphyly of “Trigonotideae“ Riedl (Boraginaceae: Boraginoideae). Systematic Botany. 35, 409–419.
- Quilichini, A., & Debussche M. (2000). Seed dispersal and germination patternsin a rare Mediterranean island endemic (Anchusa crispa Viv., Boraginaceae). Acta Oecologica. 21, 303–313.


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

**Answer / Justification:**

The nutlets morphology does not indicate mechanisms for dispersal by wind or water (Weigend et al. 2010).

**Reference(s):**


- Weigend, M., Gottschling M., Selvi F., & Hilger H. (2010). Fossil and Extant Western Hemisphere Boragineae, and the Polyphyly of “Trigonotideae“ Riedl (Boraginaceae: Boraginoideae). Systematic Botany. 35, 409–419.


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

**Answer / Justification:**

No evidence was found to confirm seed dispersal through contamination.

**Reference(s):**

- [Anonymous] .

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## Total PRE Score

**PRE Score:** 8 -- Low Potential Risk
**Confidence:** 63 / 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:** 2021 Western IPM Grant 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:

| | |
|---|---|
| • Jutta Burger | October 16, 2021 |
| • Troy Abercrombie | October 4, 2021 |
| • Alexandria Stubblefield | September 29, 2021 |

This evaluation has a total of 3 reviewer(s).

# Evaluation Issues

The following section lists all public issues for this evaluation. Issues provide a way for stakeholder reviewers to communicate any concerns or suggestions they might have with the plant or evaluation. Please email PlantRight@suscon.org if additional action is required to resolve open issues.

## Issue ID # 7383

**Date Created:** October 16, 2021 - 11:10pm
**Date Updated:** March 9, 2022 - 7:27pm

**Submitted by:** Jutta Burger

**Status:** Fixed
**Type:** Suggestion
**Severity:** Major
**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**

Published observations of this plant readily spreading in a garden environment (w citations) may be enough to infer with medium confidence that it does germinate >25% seed annually (especially if it does not propagate vegetatively). - Jutta Burger

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

I added that this species has invaded gardens through dormant seeds and included references.

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## Issue ID # 7382

**Date Created:** October 16, 2021 - 11:01pm
**Date Updated:** March 9, 2022 - 5:24pm

**Submitted by:** Jutta Burger

**Status:** Fixed
**Type:** Comment
**Severity:** Minor
**Scope:** Q08. Is the plant noted as promoting fire and/or changing fire regimes?

**Issue Description**

You can answer this question more substantively by describing its growth habit with reference. - Jutta Burger

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

I added more details about the species and a reference to back it up.

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## Issue ID # 7381

**Date Created:** October 16, 2021 - 6:18pm
**Date Updated:** March 9, 2022 - 5:18pm

**Submitted by:** Jutta Burger

**Status:** Fixed
**Type:** Suggestion
**Severity:** Minor
**Scope:** Q06. Is the species found predominately in a climate matching the region of concern?

**Issue Description**

Rephase / add specificity. Make sure to compare the Oregon climate match map to GBIF (or iNat). If more than 50% of the locations that Pentaglottis occurs in are Oregon-type climate, then the answer is "yes". So it's not just a matter of whether it occurs (and is native to) areas with OR climate. It has to mostly occur wordwide in OR-type climate. - Jutta Burger

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

I added that the native and naturalized areas where this species grows have a similar climate to Oregon's and compared GBIF to the climate map.

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## Issue ID # 7380

**Date Created:** October 16, 2021 - 6:06pm
**Date Updated:** March 9, 2022 - 5:03pm

**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**

Make sure that the "closely related genera" are really closely related to Pentaglottis. Else you are always considering the whole family.  - Jutta Burger

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

I changed my answer to no and adjusted confidence level to low. I also indicated that species within the same family are invasive but not closely related.

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## Issue ID # 7379

**Date Created:** October 16, 2021 - 6:02pm
**Date Updated:** March 9, 2022 - 4:54pm

**Submitted by:** Jutta Burger

**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**

Correction of references: Global Compendium of Weeds is actually "Randall 2017" (this is the 3rd edition and a really good resource to have downloaded). It's linked to Pentaglottis in PRE so you can just search for it and add it. Also, climate matching questions should actually reference the climate match map. This also should be connected to Pentaglottis and easily added (else you can search for it in the Bibliograph). - Jutta Burger

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

I fixed the citation and added the correct reference.

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## Issue ID # 7378

**Date Created:** October 16, 2021 - 5:57pm
**Date Updated:** March 9, 2022 - 7:30pm

**Submitted by:** Jutta Burger

**Status:** Fixed
**Type:** Suggestion
**Severity:** Minor
**Scope:** Evaluation as a whole

**Issue Description**

To correct grammer, change reference to Pentaglottis sempervirens from plural to singular (e.g., replace "they" with "it".

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

I went through and made changes. Hopefully, I got it all correct.

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## Issue ID # 7245

**Date Created:** October 4, 2021 - 10:21am

**Date Updated:** March 9, 2022 - 7:30pm

**Submitted by:** Troy Abercrombie

**Status:** Fixed
**Type:** Suggestion
**Severity:** Minor
**Scope:** Evaluation as a whole

**Issue Description**

Numerous minor grammatical errors in the justifications sections. Minor issue, but noticeable. - Troy Abercrombie

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

I went through and made changes, hopefully, I got it all correct.

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## Issue ID # 7244

**Date Created:** October 4, 2021 - 10:17am
**Date Updated:** March 9, 2022 - 4:49pm

**Submitted by:** Troy Abercrombie

**Status:** Fixed
**Type:** Comment
**Severity:** Minor
**Scope:** Q03. Is the species (or cultivar or variety) noted as being invasive in the U.S. or world?

**Issue Description**

While it is not formally listed as an invasive species in Oregon, the species has been noted to be very invasive at certain sites and has been observed to displace well established turf lawn. Numerous reports have been filed on the Oregon Invasive Species Hotline over the past 5 years. - Troy Abercrombie

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

I included details about occurrences reported of this species and its potential invasiveness.

## Issue ID # 7202

**Date Created:** September 29, 2021 - 5:23pm
**Date Updated:** December 6, 2021 - 2:42pm

**Submitted by:** Alexandria Stubblefield

**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**

Change to High Confidence instead of Very High (I didn't think this was a primary source?) - Alex Stubblefield

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

changed confidence level from very-high to high

## Issue ID # 6737

**Date Created:** July 12, 2021 - 5:34pm
**Date Updated:** July 26, 2021 - 1:46pm

**Submitted by:** Jutta Burger

**Status:** Fixed
**Type:** Suggestion
**Severity:** Major
**Scope:** Q20. Are the plant’s propagules frequently dispersed via contaminated seed, equipment, vehicles, boats or clothing/shoes?

**Issue Description**

Since there is no evidence of transport, consider leaving unanswered. Most seeds could conceivably disperse by adhering to people or their equipment, but this has to be specifically documented.

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

Left unanswered, no solid evidence was found to indicate seed dispersal through contamination.

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## Issue ID # 6736

**Date Created:** July 12, 2021 - 5:32pm
**Date Updated:** July 26, 2021 - 1:39pm

**Submitted by:** Jutta Burger

**Status:** Fixed
**Type:** Suggestion
**Severity:** Major
**Scope:** Q18. Are the plant’s propagules dispersed long distance (>100 m) by mammals or birds or via domestic animals?

**Issue Description**

Describe whether seeds have any appendages etc. (hooks/barbs) that could help with dispersal (Weigand ref is fine for this). Could mention that the related genus, Achusa, has seed dispersal through myrmecochory (https://www.sciencedirect.com/science/article/abs/pii/S1146609X00010894). The information presented does not support dispersal >100m. - Jutta Burger

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

Changed to a No with a low confidence level. No clear record of seed dispersal greater than 100 meters. I did mention the closely related species Achus seed dispersal through myrmecochory, even though the distance would still not be greater than 100 meters.

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## Issue ID # 6735

**Date Created:** July 12, 2021 - 5:29pm
**Date Updated:** August 3, 2021 - 1:56pm

**Submitted by:** Jutta Burger

**Status:** Fixed
**Type:** Suggestion
**Severity:** Minor
**Scope:** Q13. Does the species (or cultivar or variety) commonly produce viable seed?

**Issue Description**

Why is this a "medium" confidence? If it naturalizes easily and it does not reproduce vegetatively, it must produce viable seed. Just state that deduction or cite e.g. hort cites or Kew. - Jutta Burger

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

adjusted confidence level to very high and added sources

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## Issue ID # 6734

**Date Created:** July 12, 2021 - 5:27pm
**Date Updated:** August 3, 2021 - 1:16pm

**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**

Always helpful to add description of plant growth form/habit and habitat to substantiate this. Does it leave any biomass behind when it dies back? Consider adjusting confidence given lack of data. - Jutta Burger

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

Adjusted confidence level as suggested

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## Issue ID # 6733

**Date Created:** July 12, 2021 - 5:26pm
**Date Updated:** August 3, 2021 - 1:01pm

**Submitted by:** Jutta Burger

**Status:** Fixed
**Type:** Suggestion
**Severity:** Minor
**Scope:** Q06. Is the species found predominately in a climate matching the region of concern?

**Issue Description**

Reference the other resources you used to identify the species' distribution relative to the climate matching map. For instance Gbif or various inventories elsewhere. PlantRight itself is not a primary reference. - Jutta Burger

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

updated references

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## Issue ID # 6732

**Date Created:** July 12, 2021 - 5:25pm
**Date Updated:** July 26, 2021 - 11:40am

**Submitted by:** Jutta Burger

**Status:** Fixed

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

**Issue Description**

Consider Anchusa a closely related genus (since Pentaglottis was once Anchusa). - Jutta Burger

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

Changed to a Yes with high confidence due to non-peer-reviewed sources found online and overlapping climate map details comparing Pentaglottis and Anchusa.

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## Issue ID # 6731

**Date Created:** July 12, 2021 - 5:23pm
**Date Updated:** August 26, 2021 - 10:41am

**Submitted by:** Jutta Burger

**Status:** Fixed
**Type:** Suggestion
**Severity:** Minor
**Scope:** General Information

**Issue Description**

While this is a helpful summary of the plant's characteristics, this would go better in the plant description (plant page). The evaluation summary is meant to summarize mainly the evaluation findings. - Jutta Burger

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

I changed the general information to be more like an abstract of the evaluation.

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## Issue ID # 6601

**Date Created:** July 11, 2021 - 9:05pm
**Date Updated:** July 26, 2021 - 1:01pm

**Submitted by:** Lynn Sweet

**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**

Normally for plants listed as flowering in 2 seasons we would say "yes" here, so to be sure, this is "no" only if it was clearly stated in the reference that this does not seed for >3 months. For reviewers sometimes it is helpful to quote the text exactly so we can understand if this is interpretation or verbatim.

-Lynn Sweet

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

Pentaglottis starts to flower in the Spring and continues through July, indicating seeding greater than three months (Fern 2021). The confidence level was changed to high since non-peer-reviewed sources were used.

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## Issue ID # 6600

**Date Created:** July 11, 2021 - 9:04pm
**Date Updated:** August 3, 2021 - 3:12pm

**Submitted by:** Lynn Sweet

**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**

This question refers to the *age* at which the species begins to produce viable seed. This would be a sufficient answer for an annual species, but not a perennial species. Hint: https://www.rhs.org.uk/Plants/12486/Pentaglottis-sempervirens/Details

-Lynn Sweet

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

changed confidence level to medium due to a lack of direct evidence in the literature. Sources indicate species can grow at a maximum height within two years and seeds from the spring through summer, however, do not specifically state seeding within three years.

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## Issue ID # 6599

**Date Created:** July 11, 2021 - 9:03pm
**Date Updated:** July 26, 2021 - 11:57am

**Submitted by:** Lynn Sweet

**Status:** Fixed
**Type:** Suggestion
**Severity:** Major
**Scope:** Q11. Does this species (or cultivar or variety) reproduce and spread vegetatively?

**Issue Description**

Taproot resprouting is not sufficient to indicate vegetative reproduction. We'll go over this distinction next week. Taproot implies that it is the same individual plant resprouting vs. the plant reproducing this way (stolons, rhizomes, etc.).

-Lynn Sweet

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

Changed answer to no due to lack of information found and that regeneration of taproot would be considered the same plant. Information found indicates Confidence level changed to low since resources indicate seeding as the main reproduction without mentioning reproduction vegetatively.

## Issue ID # 6598

**Date Created:** July 11, 2021 - 9:02pm
**Date Updated:** July 26, 2021 - 2:26pm

**Submitted by:** Lynn Sweet

**Status:** Fixed
**Type:** Suggestion
**Severity:** Major
**Scope:** Q02. Is the species (or cultivar or variety) noted as being naturalized elsewhere in the US or world in a similar climate?

**Issue Description**

Not enough information presented. Please list the areas that match, and reference the climate matching map and the source of location information.

-Lynn Sweet

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

According to the list of occurrences in GBIF along with similar climate matches found on the climate match tool, this species has naturalized in Belgium, France, United Kingdom, Australia, Denmark, Czechia, Ireland, Germany, Norway, and the US.

# 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.