

Asolene spixii

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, May 2017

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1 Native Range and Status in the United States

Native Range

From Ghesquiere (2007):

“Southeastern of Brasil: Rio Grande do Sul and Rio Parana.”

Status in the United States

From Cowie and Hayes (2012):

“*Asolene spixii* has been seen in pet stores in Hawaii but is not in the wild.”

From APHIS (2016):

“Decollate snails (*Rumina decollata*) and aquatic snails in the family Ampullaridae (e.g., *Pomacea canaliculata*, channeled apple snail),with one exception, may not be imported or moved interstate except for research purposes into an APHIS inspected containment facility. One species complex in the family Ampullaridae, *Pomacea bridgesii (diffusa)* may move interstate without a permit because these snails are not known to be agricultural pests but are primarily algae feeders. An import permit is required for aquatic snails in order to verify species and examine shipments for contaminants that are agricultural pests.”

Means of Introduction into the United States

From Cowie and Hayes (2012):

“*Asolene spixii* has been seen in pet stores in Hawaii [...]”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From Bouchet (2013):

“Animalia (Kingdom) > Mollusca (Phylum) > Gastropoda (Class) > Caenogastropoda (Subclass) > Architaenioglossa (Order) > Ampullarioidea (Superfamily) > Ampullariidae (Family) > *Asolene* (Genus) > *Asolene spixii* (Species)”

“Status accepted”

Size, Weight, and Age Range

No information available.

Environment

From GBIF (2016):

“Not terrestrial, Not marine, Freshwater”

Climate/Range

From Ghesquiere (2007):

“This region [i.e., native range of *A. spixii*] has a sub-tropic climat [*sic*] with relatively hard winters.”

Distribution Outside the United States

Native

From Ghesquiere (2007):

“Southeastern of Brasil: Rio Grande do Sul and Rio Parana.”

Introduced

This species has not been reported as introduced or established outside of its native range.

Means of Introduction Outside the United States

This species has not been reported as introduced or established outside of its native range.

Short Description

From Ghesquiere (2007):

“Shell: The shell in *Asolene spixi* has a pointed top and the aperture (shell opening) is oval in shape, in which the corneous operculum can be retracted. The sutures are relatively flat and the umbilicus is of medium size. The shell surface is smooth and has a yellow base colour with sharp, dark brown spiral stripes on it. These dark band are mainly located at the underside of the shell (near the umbilicus), giving the shell a dark apperance when seen from the underside and a light colour from above.”

“Operculum: The corneous, medium thick operculum is concentric in construction with the nucleus located near the center of the shell (towards the columella).”

“Body: A yellow to brown base colour with dark spots, mainly located at the back of the foot and on the head. The tentacles are about the length of the foot when completely extented and breathing siphon is short (about the length of the labial tentacles).”

Biology

From Ghesquiere (2007):

“Eggs: The eggs are deposited below the water surface (aquatic) on objects or vegetation and are embedded in a gelatinous mass.”

“*Asolene spixi* is a noctural animal that rarely moves during the day and mostly hides in the soil. During the winter months, this snail species can become very inactive and remains partly burried [sic] in the soil until the tempertures raise in spring.”

“*Asolene spixi* lives in a wide variety of habitats, from rivers, ditches and canals to lakes.”

From Hayes et al. (2015):

“At least some ampullariids bear two types of intracellular pigmented corpuscles (named C and K corpuscles) in the midgut gland that are eliminated in the feces and for which a symbiotic nature has been proposed. These include the Neotropical *Pomacea canaliculata*, *P. maculata*, *P. scalaris*, *Marisa cornuarietis*, *Asolene pulchella* and *A. spixii* (d’Orbigny, 1838) (Castro-Vazquez et al., 2002; Vega et al., 2006; Takebayashi, 2013) and the Asian *Pila virens* (Meenakshi, 1955; Devi et al., 1981) and *Pila scutata* (Mousson, 1848) (as *conica* Wood, 1828, a junior synonym of *scutata*; Ng et al., 2014) introduced in Hawaii (Takebayashi, 2013). Among all the symbiotic associations summarized here, this is the only one that appears to be obligate for the host, as the symbionts are present in all individuals of all studied populations (Vega et al., 2006). [...] Because they have a plasma membrane and thick, electron dense wall, but lack a nucleus (Koch et al., 2006), they have been considered as prokaryotes.”

Human Uses

From Cowie and Hayes (2012):

“*Asolene spixii* has been seen in pet stores in Hawaii [...]”

Diseases

No information available. No OIE-reportable diseases have been documented for this species.

Threat to Humans

No information available.

3 Impacts of Introductions

This species has not been reported as introduced or established outside of its native range.

From APHIS (2016):

“Decollate snails (*Rumina decollata*) and aquatic snails in the family Ampullaridae (e.g., *Pomacea canaliculata*, channeled apple snail), with one exception, may not be imported or moved interstate except for research purposes into an APHIS inspected containment facility. One species complex in the family Ampullaridae, *Pomacea bridgesii* (*diffusa*) may move interstate without a permit because these snails are not known to be agricultural pests but are primarily algae feeders. An import permit is required for aquatic snails in order to verify species and examine shipments for contaminants that are agricultural pests.”

4 Global Distribution

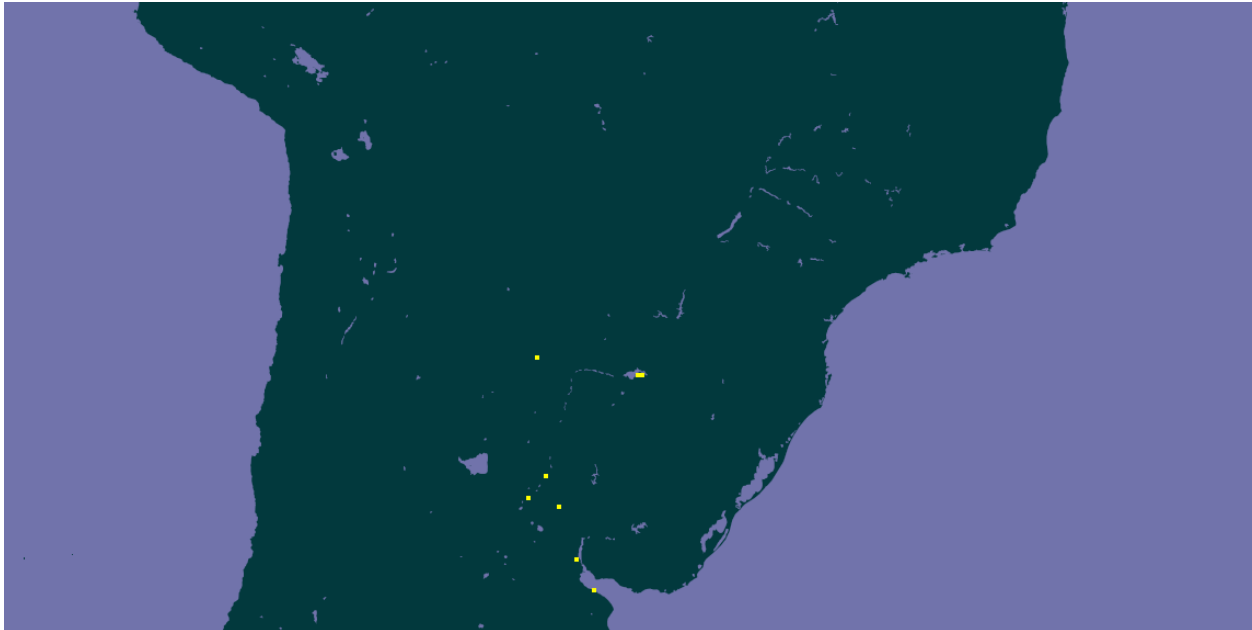


Figure 1. Known global established locations of *Asolene spixii* in South America. Map from GBIF (2016). Location in the Amazon River basin (not shown) was not included in climate matching because there is no evidence that it represents an established population.

5 Distribution Within the United States

This species has not been reported as introduced or established in the U.S.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean distance) was medium-high along the Gulf Coast and coastal Georgia, medium in the Southeast and Mid-Atlantic except in Southern Appalachian Mountains, and low elsewhere. Climate 6 score indicated that the contiguous U.S. has a medium climate match overall. Scores between 0.005 and 0.103 are classified as medium match; the Climate 6 score for *A. spixii* was 0.081.

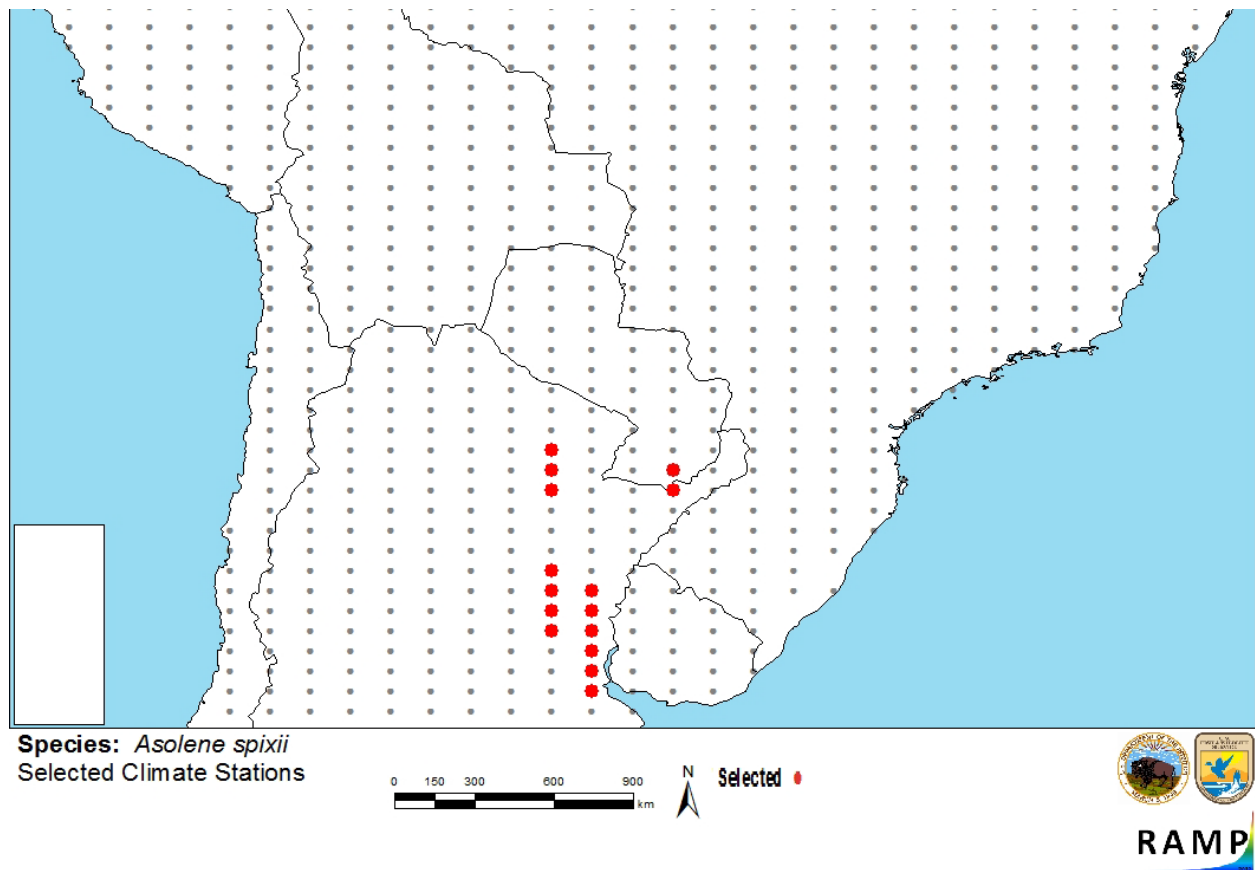


Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red) and non-source locations (gray) for *Asolene spixii* climate matching. Source locations from GBIF (2016).

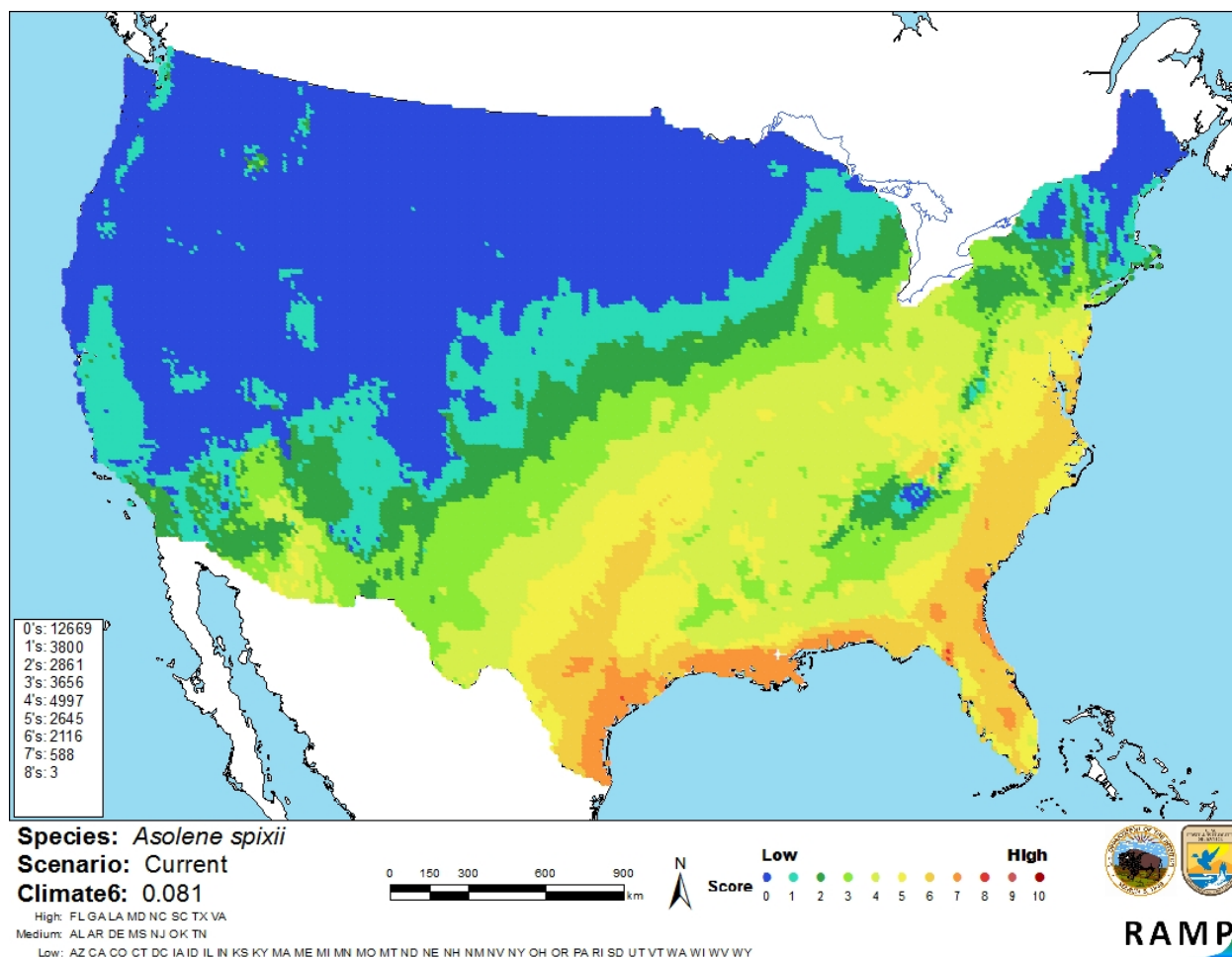


Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *Asolene spixii* in the contiguous United States based on source locations reported by GBIF (2016). 0=Lowest match, 10=Highest match. Counts of climate match scores are tabulated on the left.

The “High”, “Medium”, and “Low” climate match categories are based on the following table:

Climate 6: Proportion of (Sum of Climate Scores 6-10) / (Sum of total Climate Scores)	Climate Match Category
$0.000 < X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
≥ 0.103	High

7 Certainty of Assessment

There is limited information available on the biology and habitat of *Asolene spixii*, particularly in peer-reviewed literature. Additional information may be available in Spanish or Portuguese language papers on the species, but those sources were not able to be used for this assessment. *A. spixii* is reported as being in trade in the U.S., although it is banned from import and interstate transport except for research purposes. No introductions of *A. spixii* have been documented in the United States. Certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Asolene spixii is an aquatic freshwater snail native to South America. This species has a medium climate match with the contiguous U.S., with the areas of highest match located in the southeastern U.S. This species is prohibited from import and interstate transport in the United States, although it has been reported as in trade in Hawaii. There have been no documented introductions of *A. spixii* outside of its native range, so potential impacts of introduction to the U.S. remain unknown. Overall risk assessment category is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): Uncertain**
- **Climate Match (Sec. 6): Medium**
- **Certainty of Assessment (Sec. 7): Low**
- **Overall Risk Assessment Category: Uncertain**

9 References

Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 10.

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Sanders, S., C. Castiglione, and M. H. Hoff. 2014. Risk Assessment Mapping Program: RAMP. U.S. Fish and Wildlife Service.

10 References Quoted But Not Accessed

Note: The following references are cited within quoted text within this ERSS, but were not accessed for its preparation. They are included here to provide the reader with more information.

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Koch, E., I. A. Vega, E. A. Albrecht, H. Ortega, and A. Castro-Vazquez. 2006. A light and electron microscopic study of pigmented corpuscles in the midgut gland and feces of *Pomacea canaliculata* (Caenogastropoda: Ampullariidae). *The Veliger* 48:17-25.

Meenakshi, V. R. 1955. The excretory spherioles in the digestive gland of *Pila virens*. *Journal of Animal Morphology and Physiology* 3:75-78.

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Takebayashi, T. E. 2013. What are the C and K corpuscles of apple snails? *The Malacologist* 61:3-5.

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