

Caridina gracilipes

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, July 2017
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http://www.boldsystems.org/index.php/Taxbrowser_Taxonpage?taxid=667584. (July 2017).

1 Native Range and Status in the United States

Native Range

From Han et al. (2011):

“*Caridina gracilipes* De Man, 1892, (Caridea) is a freshwater shrimp with a wide distribution in tropical and subtropical Indo-Pacific regions. It can be found in China, Taiwan, the Philippines, and the Sulawesi Islands (Yam and Dudgeon, 2005; Cai and Shokita, 2006; Cai et al., 2006).”

From Mariappan and Richard (2006):

“[...] *C. gracilipes* enjoys wide distribution [in Tamil Nadu, India]”

Status in the United States

This species has not been documented as introduced or established in the United States.

Means of Introductions in the United States

This species has not been documented as introduced or established in the United States.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From GBIF (2016):

“KINGDOM Animalia
PHYLUM Arthropoda
CLASS Malacostraca
ORDER Decapoda
FAMILY Atyidae
GENUS *Caridina*
SPECIES *Caridina gracilipes*”

“TAXONOMIC STATUS accepted species”

Size, Weight, and Age Range

From Han et al. (2011):

“Field surveys in the Taiwanese streams have revealed that there is a significant difference in body size between populations, especially those found in streams versus those found in lakes and reservoirs. [...] The carapace lengths of landlocked females and male ranged between 0.72-5.92 mm and 1.25-4.33 mm, respectively, while their weights ranged between 0.1-165.8 mg and 1.1-70.0 mg, respectively. The carapace lengths of amphidromous females and male ranged between 1.40- 7.27 mm and 1.54-4.63 mm, respectively, while their weights ranged between 4.1-323.2 mg and 7.5-84.4 mg, respectively.”

“Based on the growth curves obtained in our study, we estimated that the longevity of male *C. gracilipes* was about 12 months, whereas the female was 14-22 months.”

From Mariappan and Richard (2006):

“Maximum size about 33mm.”

Environment

From Cai et al. (2007):

“Lower reaches of rivers and streams with seawater influence.”

From Han et al. (2011):

“It normally inhabits vegetated downstream areas, ponds, and reservoirs where water flow rate is low (Shy, 1994) [...] The life history of freshwater shrimp consists of an amphidromous population, where larvae spend time in the sea before migrating back to freshwater, and a landlocked population, in which the entire life span of the shrimp takes place in freshwater.”

Climate/Range

From Han et al. (2011):

“In this study, we collected monthly samples between September 2006 and August 2008 from a lake and a stream, representing landlocked and amphidromous populations, respectively. [...] The water temperatures at Long Luan Lake ranged from 18.8°C to 34.2°C, whereas temperatures at Kang Kou Stream ranged from 23°C to 35.8°C [...]”

“[...] subtropical [...]”

Distribution Outside the United States

Native

From Han et al. (2011):

“*Caridina gracilipes* De Man, 1892, (Caridea) is a freshwater shrimp with a wide distribution in tropical and subtropical Indo-Pacific regions. It can be found in China, Taiwan, the Philippines, and the Sulawesi Islands (Yam and Dudgeon, 2005; Cai and Shokita, 2006; Cai et al., 2006).”

From Mariappan and Richard (2006):

“[...] *C. gracilipes* enjoys wide distribution [in Tamil Nadu, India]”

Introduced

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

Means of Introduction Outside the United States

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

Short Description

From Cai et al. (2007):

“Rostrum ascendant in anterior half, slightly or distinctly extending beyond edge of scaphocerite”

“Rostrum long and slender, reaching nearly to or slightly extending beyond edge of scaphocertite, less than 1.5 times as long as carapace, armed on posterior portion of dorsal margin with more than 12 teeth, including at least 1 postorbital teeth on carapace; armed ventrally less than 20 teeth”

“Preanal carina with a spine; male first pleopod without appendix interna, or with a vestige of it on endopod”

From Richard and Chandran (1994):

“Freshly collected specimens are slightly greenish and retain this coloration when kept in mud pots or cement tanks but turn pale yellow when maintained in glass aquaria. Ventral margin of rostrum, front of carapace, junction of abdominal pleura and base of telson with prominent orange-red coloration.”

Biology

From Han et al. (2011):

“*Caridina gracilipes* [...] feeds on algae and the detritus on the bottom (Oh et al., 2003), and is preyed on by fish, birds, and other crustaceans (Hughes, 1992; Goudswaard et al., 2006).”

“Ovigerous females in the amphidromous population can be found in most of the months during our study, whereas in the landlocked population they were more abundant between May and August, which coincided with the rainy season in the region (Han et al., 2007).”

From Han et al. (2009):

“Its life histories can be classified into amphidromous and landlocked types (Hung et al. 1993; Shy and Yu 1998). The two ecological types are significantly differentiated in reproductive behaviours (Shy and Yu 1998; Cai and Shokita 2006).”

From Richard and Chandran (1994):

“Eggs yellowish, small, measuring 0.24 to 0.38 x 0.38 to 0.55 mm. Fecundity : 200 to 850. Development prolonged with 7 larval stages before postlarva.”

Human Uses

From Cai et al. (2013):

“It is unlikely that the species would be utilised.”

Diseases

From Han et al. (2011):

“[...] we found a high percentage (> 50%) of parasitic annelid worms, Branchiobdellidae (Oligochaeta), in the egg masses of landlocked females but not in those of amphidromous females (0%). These parasites usually are the major cause of egg detachment in shrimp (Oh and Hartnoll, 1999).”

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; no information is available on impacts of introductions.

4 Global Distribution



Figure 1. Known global distribution of *Caridina gracilipes*. A point in Malawi was excluded from the extent of this map as an outlier. Map from GBIF (2016).

5 Distribution Within the United States

This species has not been documented as introduced or established in the United States.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean distance) was medium in southern Florida and southern Texas. All other areas in the contiguous U.S. showed low climate match. Climate 6 score indicated a low climate match overall for the contiguous U.S. Scores of 0.000-0.005 indicate a low match; the Climate 6 score for *C. gracilipes* was 0.000.

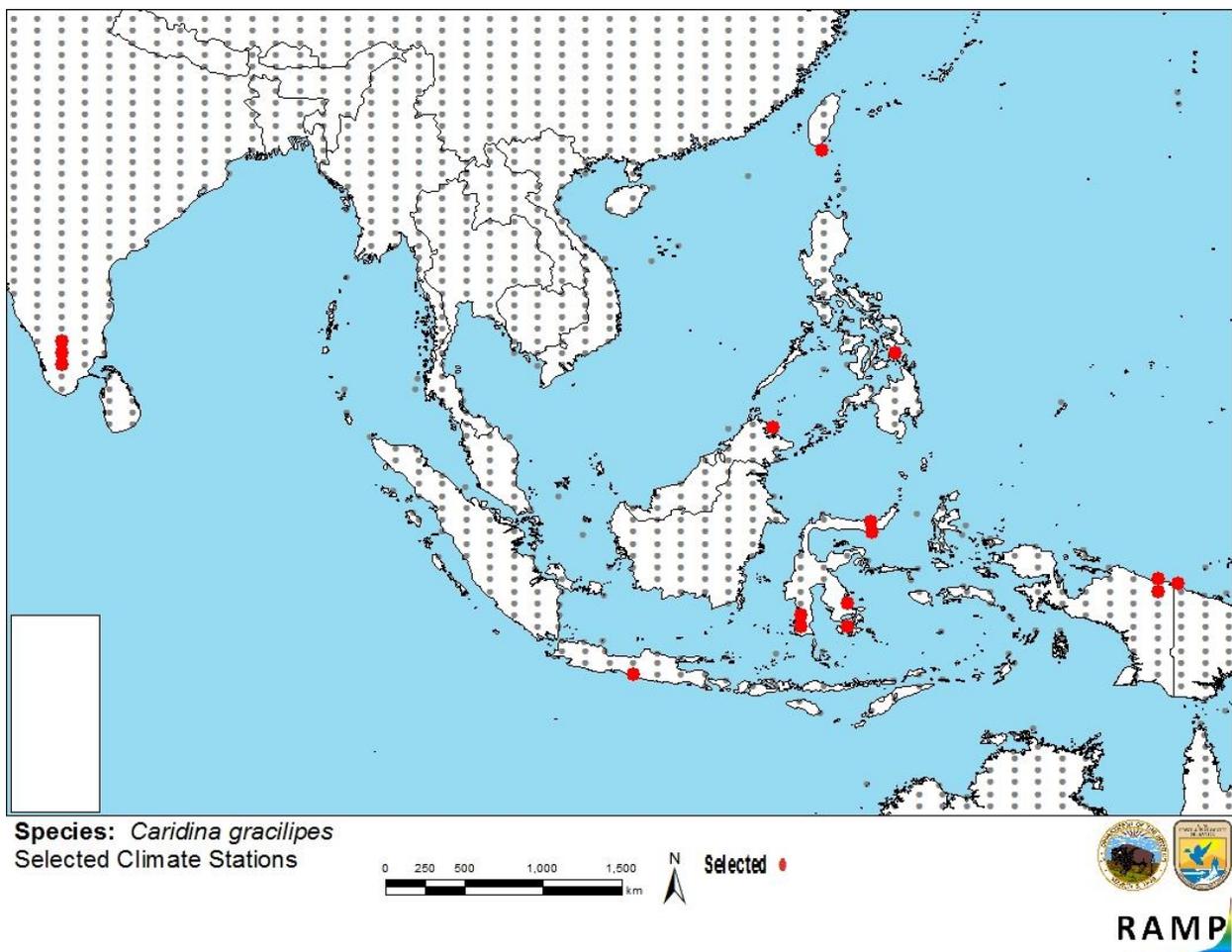


Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red) and non-source locations (gray) for *Caridina gracilipes* climate matching. Source locations from GBIF (2016). Additional location in Taiwan from Han et al. (2011).

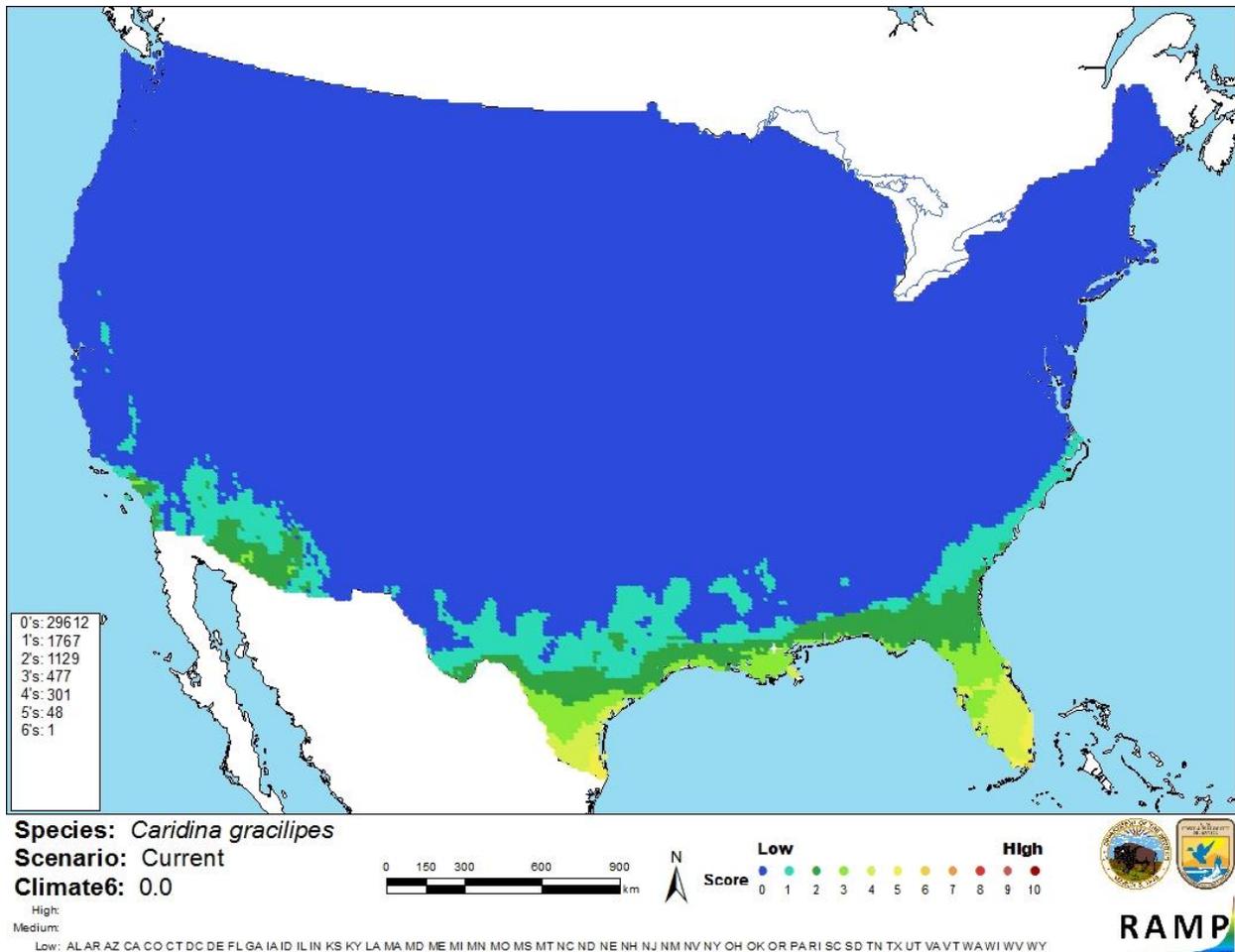


Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *Caridina gracilipes* in the contiguous United States based on source locations reported by GBIF (2016) and Han et al. (2011). 0=Lowest match, 10=Highest match. Counts of climate match scores are tabulated on the left.

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
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
≥ 0.103	High

7 Certainty of Assessment

There is an abundance of scientifically credible information available on *Caridina gracilipes*. Despite this, the species has never been reported as introduced or established outside of its native range. Because there is no documented history of introduction on which to base this risk assessment, certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Caridina gracilipes is a small freshwater shrimp native to southern and southeastern Asia. This species has a low climate match with the contiguous United States. *C. gracilipes* is one of the better-studied *Caridina* shrimps, but has no documented history of introduction. Because of this, possible impacts of introduction are unknown and the certainty of this assessment is low. Further information is needed to adequately assess the risk this species poses. Overall risk assessment category is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): Uncertain**
- **Climate Match (Sec. 6): Low**
- **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.

Cai, Y., P. K. Ng, and S. Choy. 2007. Freshwater shrimps of the family Atyidae (Crustacea: Decapoda: Caridea) from peninsular Malaysia and Singapore. *Raffles Bulletin of Zoology* 55:277-309.

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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.

Cai, Y., and S. Shokita. 2006. Report on a collection of freshwater shrimps (Crustacea: Decapoda: Caridea) from the Philippines, with descriptions of four new species. *Raffles Bulletin of Zoology* 54:245-270.

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Hung, M. S., T. Y. Chan, and H. P. Yu. 1993. Atyid Shrimps (Decapoda: Caridea) of Taiwan, with descriptions of three new species. *Journal of Crustacean Biology* 13:481-503.

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