

Needlenose Caridina (*Caridina gracilirostris*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, July 2017

Web Version, 11/17/2017



Photo: Oorenotsoo. Public domain. Available:
https://commons.wikimedia.org/wiki/File:Caridina_gracilirostris.JPG. (July 2017).

1 Native Range and Status in the United States

Native Range

From De Grave et al. (2013):

“This is a widespread species, occurring from Madagascar through to Japan and Fiji (Cai and Ng 2007).”

“Cambodia; Fiji; India; Indonesia (Kalimantan, Lesser Sunda Is., Papua, Sulawesi, Sumatera); Japan; Madagascar; Malaysia (Peninsular Malaysia, Sarawak); Palau; Philippines; Singapore; Taiwan, Province of China (Taiwan, Province of China (main island)); Thailand”

Status in the United States

This species has not been reported as introduced or established in the United States. This species is in trade in the U.S.

From Heerbrandt and Lin (2006):

“Over the past several years, many freshwater shrimp from the family Atyidae have also been growing in popularity in the aquarium industry. [...] The wholesale value of these shrimp in the United States is about \$1– \$2 per shrimp.”

From Bob’s Tropical Plants (2017):

“*Caridina gracilirostris* - Red Nose Shrimp [...] \$3.49 tax excl.”

Means of Introductions in the United States

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

Remarks

From The Aquarium Wiki (2011):

“Alternative Names

Rhino Shrimp, Red Nose Shrimp, Rudolph Shrimp, Mosquito Shrimp, Redfronted Shrimp, Rocket Shrimp, Needlenose Caridina, Rote Nashorngarnele”

From GBIF (2016):

“SYNONYMS

Caridina pseudogracilirostris Thomas, V.K. Pillai & N.N. Pillai, 1976”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2017):

“Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Protostomia
Superphylum Ecdysozoa
Phylum Arthropoda
Subphylum Crustacea

Class Malacostraca
Subclass Eumalacostraca
Superorder Eucarida
Order Decapoda
Suborder Pleocyemata
Infraorder Caridea
Superfamily Atyoidea
Family Atyidae
Genus *Caridina*
Species *Caridina gracilirostris* De Man, 1892 – needlenose
caridina”

“Taxonomic Status:
Current Standing: valid”

Size, Weight, and Age Range

From Heerbrandt and Lin (2006):

“Females become sexually mature as early as 4.8-mm CL [...], while males’ size at sexual maturity is unclear.”

“It takes about 6 mo for the shrimp to reach sexual maturity and market size (20-mm TL; T. Heerbrandt, unpublished data).”

From Tiwari and Pillai (1971):

“A large female measures 12.0 mm from the tip of rostrum to the tip of the hind margin of carapace, a male measuring 9.0 mm.”

Environment

From Palomares and Pauly (2017):

“Found in fresh or slightly brackish water [Holthuis 1980]”

“Demersal; freshwater; brackish”

From Heerbrandt and Lin (2006):

“The larvae [...] require brackish water in order to survive and develop. The optimal salinity and temperature appear to be 15 ppt and 27 C [...]”

“Adult shrimp can survive at 15 ppt and females can spawn regularly.”

Climate/Range

From Palomares and Pauly (2017):

“Tropical”

Distribution Outside the United States

Native

From De Grave et al. (2013):

“This is a widespread species, occurring from Madagascar through to Japan and Fiji (Cai and Ng 2007).”

“Cambodia; Fiji; India; Indonesia (Kalimantan, Lesser Sunda Is., Papua, Sulawesi, Sumatera); Japan; Madagascar; Malaysia (Peninsular Malaysia, Sarawak); Palau; Philippines; Singapore; Taiwan, Province of China (Taiwan, Province of China (main island)); Thailand”

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 Arudpragasam and Costa (1962):

“The species can be easily recognised on the basis of its external features alone. The body is long and of very graceful proportions, slightly arched its middle. The rostrum is very long, being a little over twice the post-orbital length of the carapace. The body is translucent and almost white. Certain portions have a vivid colouration. The rostrum, the distal portion of the telson, the uropods and the tips of the pleopods are all of a deep reddish brown color.”

Biology

From Heerbrandt and Lin (2006):

“Larvae of this genus feed on phytoplankton, and the adults are omnivores and scavengers (Jalihal et al. 1994).”

“[...] adults of several species of *Caridina* (*C. gracilipes*, *C. prox. shenoyi*, *C. pseudogracilirostris*, *C. japonica*, and *C. gracilirostris*) are very tolerant to a range of salinities and the larvae need brackish water to develop and complete metamorphosis (Pillai 1975; Kandreakar and Sankolli 1987; Hamano et al. 1994; Jalihal et al. 1994; Richard and Chandran 1994). This would require these shrimp that inhabit freshwater to migrate to saline water to mate and/or to release larvae. If larvae are released in freshwater, then the larvae must be capable of

reaching the saline water where metamorphosis can be completed. The settled shrimp must migrate back to freshwater habitats.”

From Cai and Ng (2007):

“Habitat

Lower parts of streams or rivers with seawater influence, very often from brackish water.”

Human Uses

From De Grave et al. (2013):

“Holthuis (1980) mentions the species is of minor commercial importance in India, Indonesia and the Philippines. The species is also of significant importance in the ornamental aquarium trade.”

From Heerbrandt and Lin (2006):

“Over the past several years, many freshwater shrimp from the family Atyidae have also been growing in popularity in the aquarium industry. [...] The wholesale value of these shrimp in the United States is about \$1– \$2 per shrimp.”

“*Caridina gracilirostris* has great potential for aquaculture. Aquacultured shrimp may replace the limited supply from overseas for the aquarium trade market in the United States. The larvae are well adapted to captive rearing.”

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.

4 Global Distribution



Figure 1. Known global established locations of *Caridina gracilirostris*. Map from GBIF (2016). Locations in Australia were excluded from the map because they do not represent established populations (De Grave et al. 2013).

5 Distribution Within the United States

This species has not been reported 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 low across the contiguous United States except for areas of medium match in peninsular Florida and coastal Texas. Climate 6 scores indicated a low climate match for the contiguous U.S. overall. Scores of 0.005 or less indicate a medium match; the Climate 6 score for *C. gracilirostris* was 0.000.

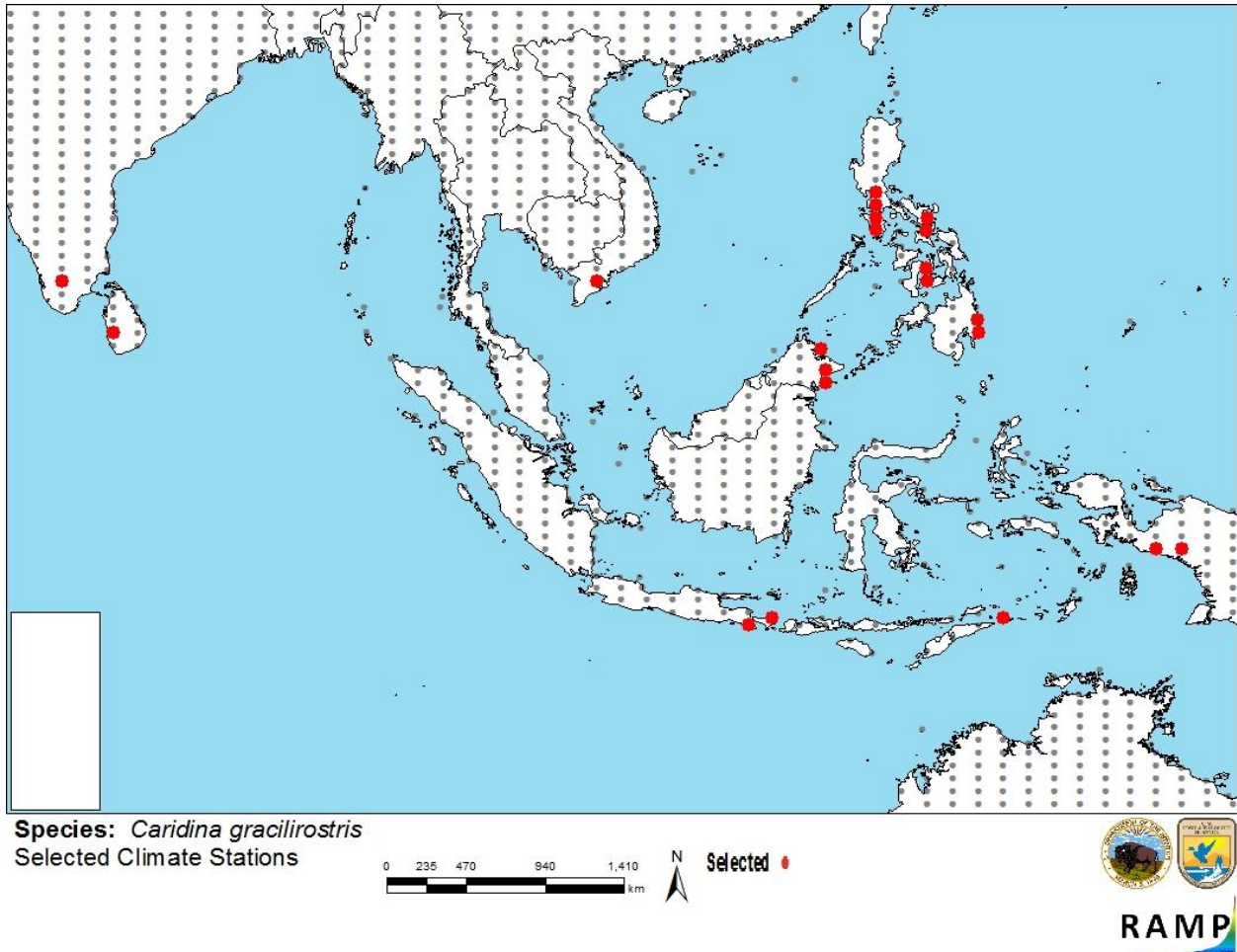


Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red) and non-source locations (gray) for *Caridina gracilirostris* climate matching. Source locations from GBIF (2016). Additional location in Sri Lanka from Arudpragasam and Costa (1962).

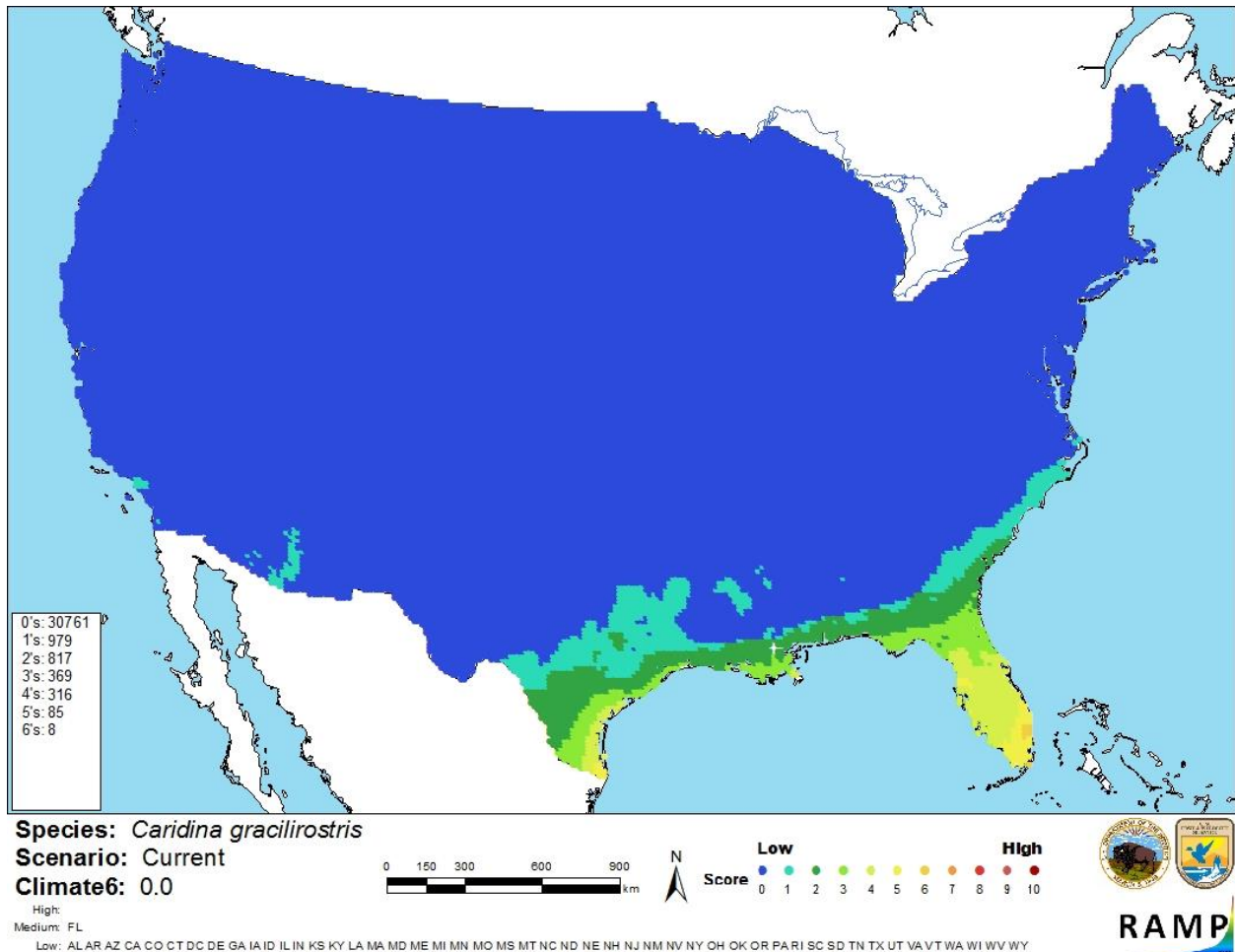


Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *Caridina gracilirostris* in the contiguous United States based on source locations reported by GBIF (2016) and Arudpragasam and Costa (1962). 0=Lowest match, 10=Highest match. Counts of climate match scores are tabulated on the left.

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 adequate information available on the biology and ecology of *Caridina gracilirostris*. There are gaps in the spatially explicit location data available for this species in contrast to the verbally described range, so climate match may be underestimated in this assessment. *C. gracilirostris* has never been reported as established outside of its native range, so potential for invasiveness is unknown. For these reasons, certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Caridina gracilirostris is a small freshwater shrimp native to Asia. It is present in the aquarium trade and its biology makes it suitable for production through aquaculture. *C. gracilirostris* has a low climate match with the contiguous United States overall, with areas of medium match in Florida and Texas. This species has no known history of invasiveness; it has never been documented as introduced or established outside of its native range. Because of a lack of information, certainty of this assessment is low. 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.

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Bob's Tropical Plants. 2017. Rudolf shrimp. Available: <https://www.bobstropicalplants.com/shop/en/shrimp/1202-rudolph-shrimp.html>. (July 2017).

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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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