

## *Caridina babaulti*

### Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, July 2017  
Web Version, 11/17/2017



Photo: D. Blankenhaus. Licensed under CC BY-SA. Available:  
<https://commons.wikimedia.org/wiki/File:Caridina-cf-babaulti-green.jpg>. (May 2017).

## 1 Native Range and Status in the United States

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### Native Range

From De Grave (2013):

“India; Iran, Islamic Republic of; Iraq”

“One subspecies is only known with certainty from a number of sites in central India, based on material collected on or before 1927 (Roux 1931); with the other subspecies only formally known from a single site in southern Iraq (Al-Adhub and Hamzah 1987), as well as two sites in southern Iran (Gorgin 1996), but is likely to be more widespread in the region.”

From Kazmi and Kazmi (2010):

“Distribution: Central India, Iran and Iraq and for the first time from Pakistan.”

## 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 Bob’s Tropical Plants (2017):

“*Caridina babaulti* ‘green’ [...] \$3.00 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 De Grave (2013):

“The species consists of two subspecies, *Caridina babaulti babaulti* distributed in India, but poorly known and *Caridina babaulti basrensis* distributed in Iran and Iraq. Currently it is not known if both subspecies could represent valid species or if a single, variable species is involved.”

## 2 Biology and Ecology

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### Taxonomic Hierarchy and Taxonomic Standing

From GBIF (2016):

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

“TAXONOMIC STATUS  
accepted species”

## **Size, Weight, and Age Range**

From Al-Adhub and Hamzah (1987):

“Total length of the ovigerous holotype female 28 mm from the tip of the rostrum to the end of the telson.”

From Abdulla et al. (2015):

“The maximum size of male carapace length was 8 mm; the maximum size of female carapace length was 9 mm [...]”

## **Environment**

From De Grave (2013):

“The ecology of the Indian subspecies is not known, but the Middle Eastern subspecies lives in rivers and streams.”

“Freshwater”

## **Climate/Range**

From Idrisi and Salman (2005):

“The climate of the region is subtropical with distinct winter (wet) and summer (dry) seasons.”

“Development of larval stages appeared to be inhibited and do not complete development through all larval stages at low temperatures. [...] Only 20% of the larvae successfully molted from stage III to stage IV zoeae ( $4.89 \pm 0.04$  days) at 20°C [...] No larvae were successful in molting from stage IV to stage V zoeae.”

## **Distribution Outside the United States**

Native

From De Grave (2013):

“India; Iran, Islamic Republic of; Iraq”

“One subspecies is only known with certainty from a number of sites in central India, based on material collected on or before 1927 (Roux 1931); with the other subspecies only formally known from a single site in southern Iraq (Al-Adhub and Hamzah 1987), as well as two sites in southern Iran (Gorgin 1996), but is likely to be more widespread in the region.”

From Kazmi and Kazmi (2010):

“Distribution: Central India, Iran and Iraq and for the first time from Pakistan.”

## 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 Al-Adhub and Hamzah (1987):

“The rostrum is short and slender, rather straight, with a slight upward tilt at the distal end. It extends to the end of the second segment of the antennular peduncle or slightly less far, rarely a little beyond the segment. The tip of the rostrum terminates in a sharp point. Its dorsal armature consists of 16 to 27 closely packed teeth interspersed with prominent hairs (bristles). Six to eight of the teeth are placed on the carapace behind the posterior limit of the orbit. There are 4 to 11 (usually 6 or 7) ventral rostral teeth, situated in the distal half of the rostrum. The terminal portion of the rostrum is unarmed, both dorsally and ventrally. The carapace [...] shows a strongly developed antennal spine, situated on the lower angle of the orbit.”

“The antennule has a triangular, sharply pointed stylocerite extending to about  $\frac{3}{4}$  the length of the first peduncular segment. There is no distinct antennular carina. The spine of the antennal scale extends well beyond the tip of the antennular peduncle.”

“The chela of the first cheliped [...] is more than twice as long as broad. The carpus is deeply excavated anteriorly and attached to the chela ventrally; the chela projects backward beyond the point of attachment. The carpus is shorter than the chela and about  $1\frac{1}{2}$  times as long as broad. The chela of the second cheliped [...] is about twice as long as broad. The carpus is about 5 to 6 times as long as broad.”

“The dactylus of the third pereopod [...] is about  $\frac{1}{4}$  the length of the propodus and bears a ventral fringe of 7 spines; the propodus is 8 times as long as broad; the merus has 4 articulated spines whereas the ischium has a single articulated spine or none. The dactylus of the fourth pereopod [...] is about  $\frac{1}{5}$  the propodus length and bears a ventral fringe of 8-9 spines; the propodus is about 10 times as long as broad; the merus has 4 articulated spines while the ischium is lacking spines. The dactylus of the fifth pereopod [...] is about  $\frac{1}{4}$  the propodus length and bears a ventral fringe of about 37 spinules; the propodus is about 10 times as long as broad; the merus has 2 articulated spines while the ischium is without spines.”

“The telson [...] has a convex posterior edge with a short, acutely pointed median spine. The posterior margin bears 3 pairs of spines: the outermost are the longest. There are also 4 pairs of thin intermediate hairs. The telson has also 4 to 6 (usually 5) pairs of dorsal spines. The exopodite of the uropod [...] bears a series of 18 to 20 spinules along the diaeresis.”

## Biology

From Idrisi and Salman (2005):

“Adult *C. babaulti basrensis* live in dense stands of hornwort (*Ceratophyllum demersum*) with another atyid shrimp, *Atyaephyra desmaresti mesopotamica* and the hymenosomatid crab, *Elamenopsis kempi* (Al-Adhub 1987; Al-Adhub & Hamzah 1987; Ali et al. 1995). Gravid female *C. babaulti basrensis* appear in the hornwort starting in March until October. Since this species is multivoltine, reproduction is continuous throughout the spring, summer, and autumn months. Each female can carry between 50 and 70 embryos, and can become gravid multiple times. This species' life cycle covers an annual cycle with five larval stages after hatching, followed by a megalopal stage, all six stages remain in the plankton from one to two weeks (Salman [1987]). The planktonic larval stages are followed by several juvenile stages until maturity where they finally reside in the hornwort (Al-Adhub & Hamzah 1987).”

From Abdulla et al. (2015):

“Seasonal changes in population density, structure of *Caridina babaulti basrensis* were studied in Garmat Ali River between January and December 2000. The Average population density ranged from 58 ind/m<sup>2</sup> in January to 307 ind/m<sup>2</sup> in September. [...] the number of eggs laid by females ranged from 69 to 457.”

## Human Uses

From Jayalal and Ramachandran (2012):

“[...] 45 ornamental shrimps were found to be exported from India [...]”

“Ornamental shrimps being exported [...] *Caridina babaulti*”

From Aquatic Arts (2017):

“Green Babaulti Shrimp are a fairly rare specimen within the aquarium hobby. Dwarf shrimp are hard enough to find at pet stores, and you'd be especially hard-pressed to find these in any pet store in the United States.”

From Bob's Tropical Plants (2017):

“*Caridina babaulti* "green" [...] \$3.00 tax excl.”

## Diseases

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

## Threat to Humans

No information available.

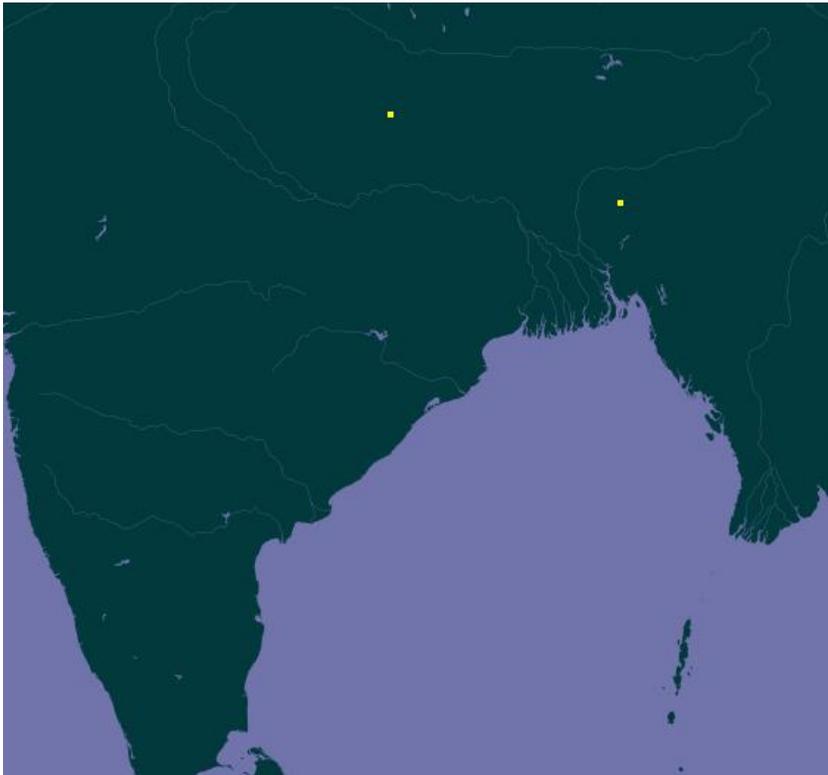
### 3 Impacts of Introductions

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

### 4 Global Distribution

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**Figure 1.** Known global established locations of *Caridina babaulti*. Map from GBIF (2016). Point reported in Vietnam (not shown) was excluded from climate matching because there is no evidence that it represents an established population.

### 5 Distribution Within the United States

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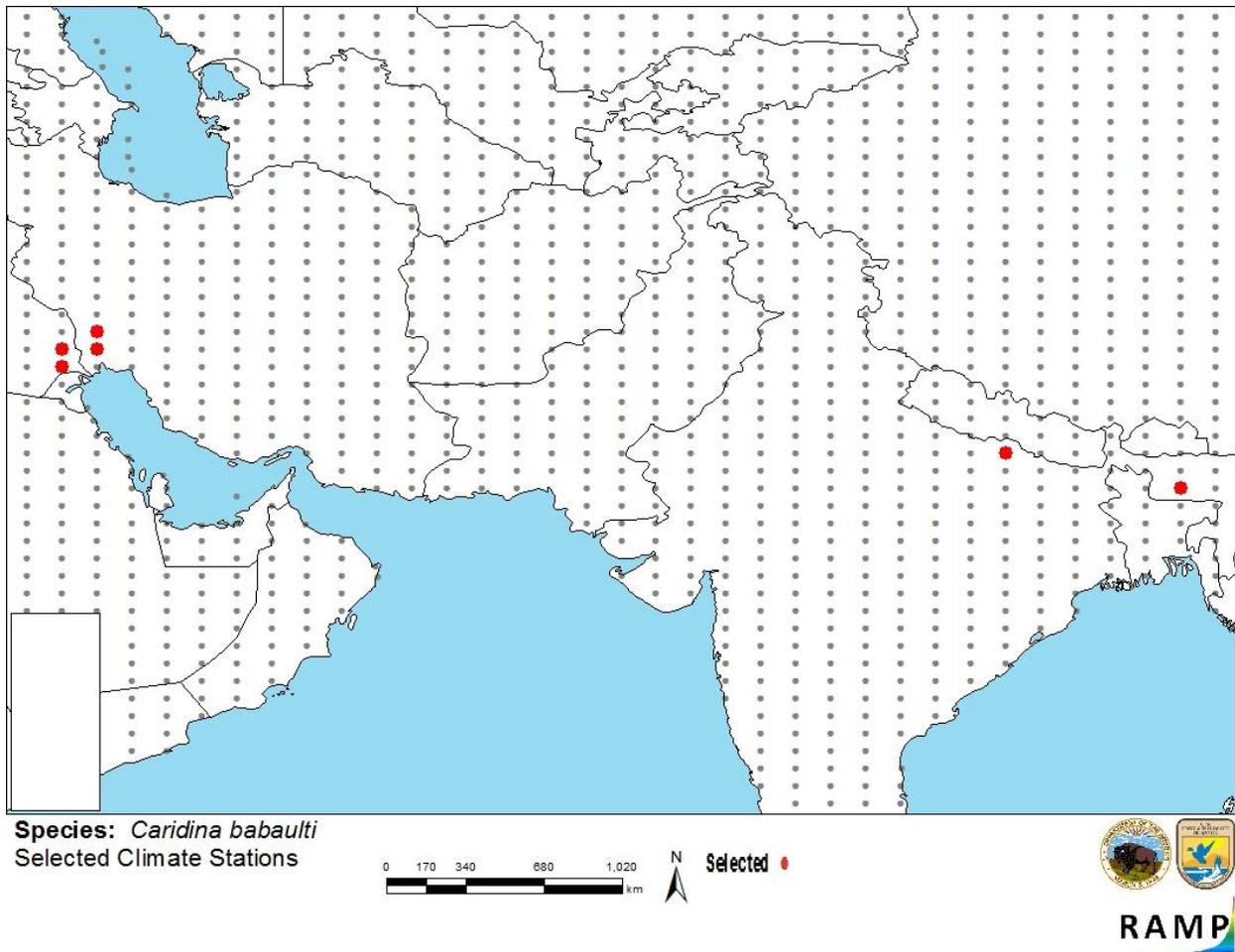
This species has not been reported as introduced or established in the United States.

### 6 Climate Matching

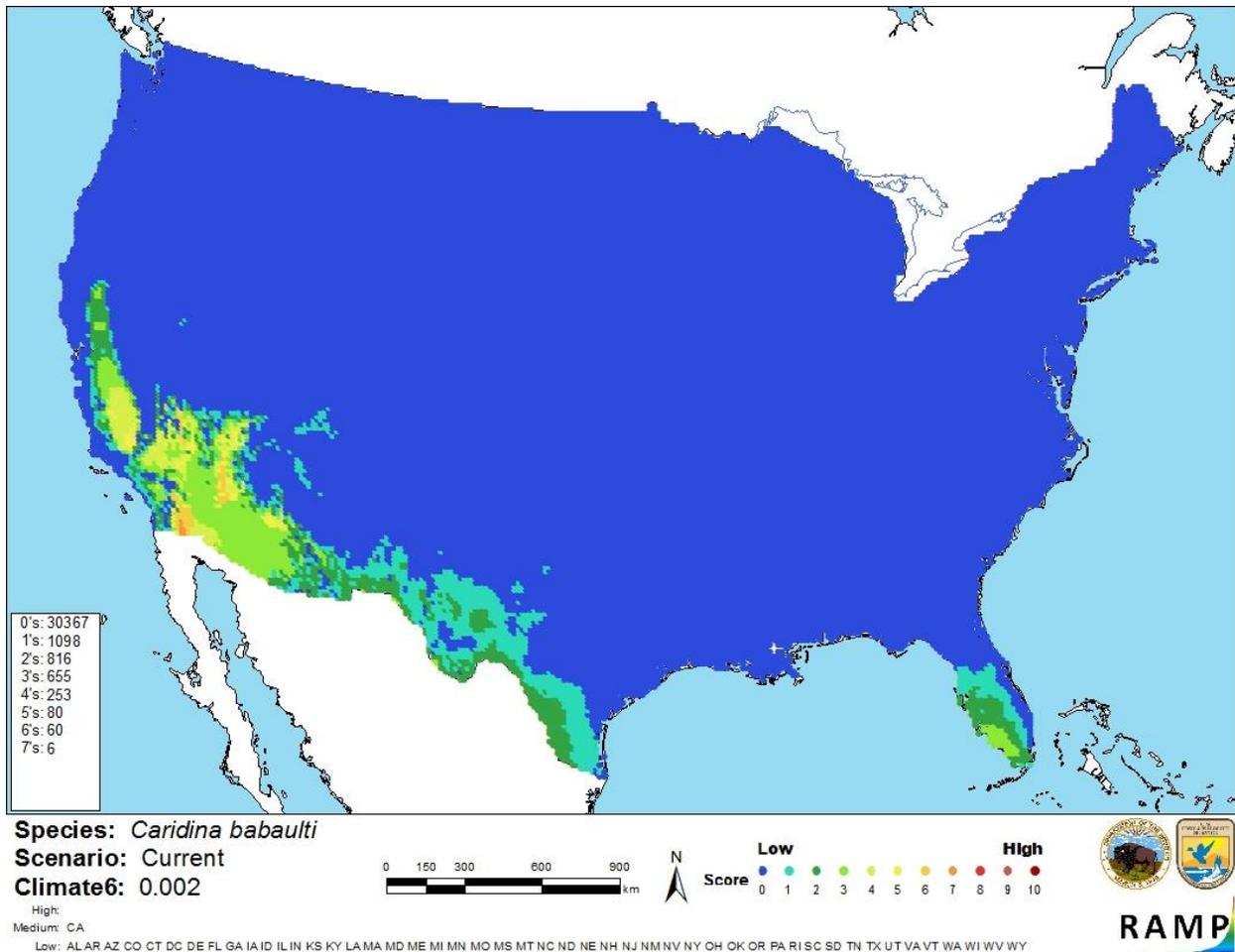
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#### Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean distance) was low across the contiguous U.S. except for small areas of medium match in the Southwest and central California. Climate 6 score indicated that the contiguous U.S. has a low climate match overall. Scores of 0.005 or less indicate a low match; the Climate 6 score for *C. babaulti* was 0.002.



**Figure 2.** RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red) and non-source locations (gray) for *Caridina babaulti* climate matching. Source locations from GBIF (2016) with additional locations in Iraq and Iran from Idrisi and Salman (2005) and Gorgin (1996), respectively.



**Figure 3.** Map of RAMP (Sanders et al. 2014) climate matches for *Caridina babaulti* in the contiguous United States based on source locations reported by Gorgin (1996), Idrisi and Salman (2005), and 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
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
$\geq 0.103$	High

## 7 Certainty of Assessment

Some information is available on the biology and ecology of *Caridina babaulti* but its native distribution is poorly documented. There is also taxonomic confusion over whether the species as currently described has two subspecies, or whether those two subspecies are actually two separate species. No history of introduction outside the native range has been reported, and

further information is needed to adequately assess the risk this species poses. Certainty of this assessment is low.

## 8 Risk Assessment

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### Summary of Risk to the Contiguous United States

*Caridina babaulti* is a small freshwater shrimp native to Asia. This species is present in the aquarium trade. There is little scientific information available on this species, and there is some uncertainty regarding its taxonomy. No introductions of the species have been reported, so potential impacts of introducing this species into the United States remain unknown. *C. babaulti* has a low climate match with the contiguous United States. 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

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

Abdulla, S. B., K. D. Saoud, and S. G. Ajeel. 2015. Population dynamics of the fresh water shrimp *Caridina babaulti basrensis* (Decapoda: Atyidae) from Garmat-Ali River-Iraq. *Hawlyat Al-Montada* 1(2):3-11.

Al-Adhub, A. H. Y., and H. A. Hamzah. 1987. *Caridina babaulti basrensis* subsp. nov., from the Shatt al-Arab region, Iraq (Decapoda, Caridea, Atyidae). *Crustaceana* 52(3):225-228.

Aquatic Arts. 2017. Green babaulti shrimp – care guide. Aquatic Arts. Available: <https://aquaticarts.com/pages/green-babaulti-shrimp-care-guide>. (July 2017).

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- Gorgin, S. 1996. The first record of two species of freshwater shrimps (Decapoda, Caridea, Atyidae) from Iran. *Crustaceana* 69(5):662-668.
- Idrisi, N., and S. D. Salman. 2005. Distribution, development, and metabolism of larval stages of the warmwater shrimp, *Caridina babaulti basrensis* (Decapoda, Atyidae). *Marine and Freshwater Behaviour and Physiology* 38(1):31-42.
- Jayalal, L., and A. Ramachandran. 2012. Export trend of Indian ornamental fish industry. *Agriculture and Biology Journal of North America* 3(11):439-451.
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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

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**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.**

- Al-Adhub, A. H. Y. 1987. On a new subspecies of a freshwater shrimp (Decapoda, Atyidae) from the Shatt Al-Arab River, Iraq. *Crustaceana* 53:1-4.
- Ali, M. H., S. D. Salman, and A. H. Y. Al-Adhub. 1995. Population dynamics of the hymensomatid crab *Elamenopsis kempi* in a brackish subtidal region of Basrah, Iraq. *Scientia Marina* 59:1-13.
- Roux, J., J. Carl, and K. Escher. 1931. Voyage de recherches zoologiques dans l'Inde méridionale (Hiver 1926-27). Crustacés décapodes d'eau douce de l'Inde méridionale. *Revue Suisse de Zoologie* 38:31-62.
- Salman, S. D. 1987. Larval development of *Caridina babaulti basrensis* (Al-Adhub and Hamzah) (Decapoda, Caridea, Atyidae) reared in the laboratory. *Crustaceana* 52:229-244.