

***Pontogammarus borceae* (an amphipod, no common name)**

Ecological Risk Screening Summary

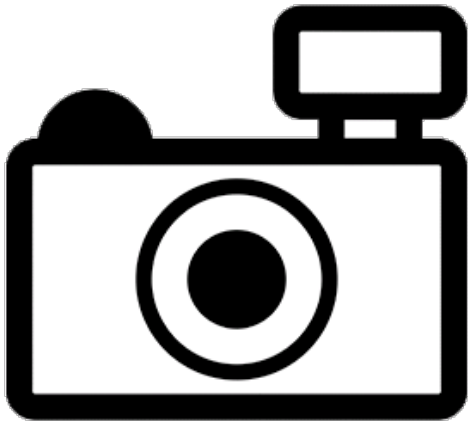
U.S. Fish & Wildlife Service, February 2022

Revised, March 2022

Web Version, 12/6/2022

Organism Type: Crustacean

Overall Risk Assessment Category: Uncertain



No Photo Available

1 Native Range and Status in the United States

Native Range

From Stock et al. (1998):

“*P. borceae* has only been recorded from the Pontic area (Rumania, Bulgaria, and possibly from the Sea of Azov and the river Volga; see Carausu et al., 1955: 148).”

From Mirzajani et al. (2011):

“[...] *P. borceae* from southern Caspian sea shore [Iran] [...]”

Status in the United States

No records of *Pontogammarus borceae* in trade or in the wild in the United States were found.

Means of Introductions in the United States

No records of *Pontogammarus borceae* in the wild in the United States were found.

Remarks

No additional remarks.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From Lowry (2010):

“Animalia (Kingdom) > Arthropoda (Phylum) > Crustacea (Subphylum) > Multicrustacea (Superclass) > Malacostraca (Class) > Eumalacostraca (Subclass) > Peracarida (Superorder) > Amphipoda (Order) > Senticaudata (Suborder) > Gammarida (Infraorder) > Gammaridira (Parvorder) > Gammaroidea (Superfamily) > Pontogammaridae (Family) > *Pontogammarus* (Genus) > *Pontogammarus borceae* (Species)”

“Status accepted”

Size, Weight, and Age Range

According to Mirzajani et al. (2011) the mean length for a female *Pontogammarus borceae* is 8.62 ± 0.10 mm and a male is 8.60 ± 0.09 mm. The size range of reproductive females was 5–13.3 mm.

From Mirzajani et al. (2011):

“Individuals of *P. borceae* less than 6 mm long (Figure 2 [in source material]) were recorded throughout the year while the large specimens (>9 mm) were dominant in spring and winter (from 16 to 38% of the population). The maximum mean length was recorded in May and the minimum in January (Figure 4 [in source material]).”

Environment

From Stock et al. (1998):

“In the Pontic area, it is a rheophilous species, but in the Caspian Sea it occurs in the surf zone.”

From Mirzajani et al. (2011):

“Two other benthos species, *Pontogammarus maeoticus*, and *P. borceae* live in brackish water with salinity of 7.1 ± 4.1 ppt, fine sandy shores, well oxygenated water, and weakly alkaline pH (Table 4 [in source material]).”

Climate

Information on climate requirements was not found for *Pontogammarus borceae*.

Distribution Outside the United States

Native

From Stock et al. (1998):

“*P. borceae* has only been recorded from the Pontic area (Rumania, Bulgaria, and possibly from the Sea of Azov and the river Volga; see Carausu et al., 1955: 148).”

From Mirzajani et al. (2011):

“[...] *P. borceae* from southern Caspian sea shore [Iran] [...]”

Introduced

No records of introductions were found for *Pontogammarus borceae*.

Means of Introduction Outside the United States

No records of introductions were found for *Pontogammarus borceae*.

Short Description

No short description was found for *Pontogammarus borceae*.

Biology

From Mirzajani et al. (2011):

“The sex ratios were highly variable for all species during the year while in the adult stage the male dominated. In *P. borceae* the sex ratio was 1:1.1, [...]”

“The mean number of eggs of *G. lacustris* and *P. borceae* was 10.2 ± 5.2 and 14.9 ± 13.1 , respectively.”

Human Uses

From Mirzajani et al. (2011):

“According to these field observations and the supplementary laboratory experiments it was concluded that four species, *P. maeoticus*, *P. borceae*, *O. acuminatus*, and *G. aequicauda*, seem to be good candidates for potential use in warm water fish farms. However, a subsequent study [Mirzajani 2009] produced negative results as Amphipoda replacement in fish culture ponds was not satisfactory with most animals dead within a few days.”

Diseases

No records of OIE- reportable diseases (OIE 2022) were found for *Pontogammarus borceae*.

No information on diseases was found for *Pontogammarus borceae*.

Threat to Humans

No information on threats to humans was found for *Pontogammarus borcae*.

3 Impacts of Introductions

No records of introductions were found for *Pontogammarus borcae*; therefore there is no information on impacts of introductions.

4 History of Invasiveness

No reports of introductions of *Pontogammarus borcae* outside its native range were found and there is no evidence suggesting this species is in trade. Therefore, the history of invasiveness is classified as No Known Nonnative Population.

5 Global Distribution



Figure 1. Known collection locations of *Pontogammarus borcae* in the Caspian Basin. Map created with ArcPro ©Esri with species distribution information from Stock et al. (1998) and Mirzajani et al. (2011).

Stock et al. (1998) also mentioned that *Pontogammarus borcae* could be found in Romania, Bulgaria, and possibly from the Sea of Azov and Volga River but did not provide coordinates or

more detailed information for those locations. Those descriptions were too broad to estimate the species range with any certainty, therefore, they will not be included in the climate matching analysis.

6 Distribution Within the United States

No records of *Pontogammarus borceae* in the wild in the United States were found.

7 Climate Matching

Summary of Climate Matching Analysis

The majority of the contiguous United States had a medium climate match. There were areas of high match in the Intermountain West and the southwest. Areas of low match were found along the mid and northern Pacific Coast, the Gulf Coast, southern Florida, the northern Northeast, and the upper Great Plains. Everywhere else had a medium match. The overall Climate 6 score (Sanders et al. 2021; 16 climate variables; Euclidean distance) for the contiguous United States was 0.300, High (scores greater than or equal to 0.103 are classified as high). Most States had high individual Climate 6 scores. Louisiana, Massachusetts, Maryland, Michigan, Mississippi, North Carolina, New York, Pennsylvania, South Dakota, and Wisconsin had medium individual Climate 6 scores. Connecticut, Delaware, Florida, Iowa, Kansas, Maine, Minnesota, North Dakota, Nebraska, New Hampshire, New Jersey, Rhode Island, and Vermont had low individual Climate 6 scores. The climate match presented here does not factor in any salinity requirements of the species. This climate match may be an under representation of suitable climate for this species as a large portion of the species' range was not able to be represented in the source points due to a lack of georeferenced observations.

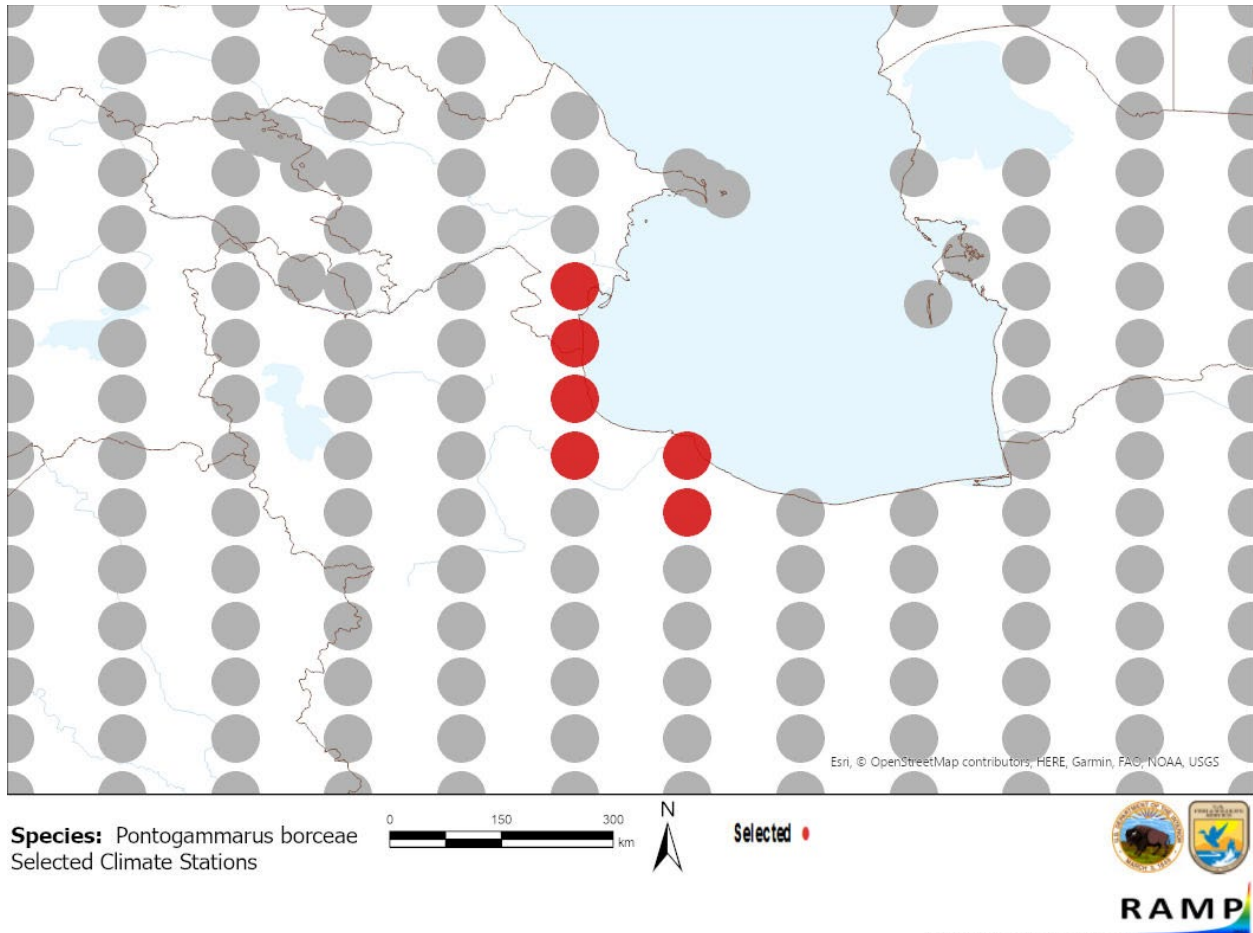


Figure 2. RAMP (Sanders et al. 2021) source map showing weather stations around the Caspian Sea selected as source locations (red; Azerbaijan, Iran) and non-source locations (gray) for *Pontogammarus borceae* climate matching. Source locations based on observations reported by Stock et al. (1998) and Mirzajani et al. (2011). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

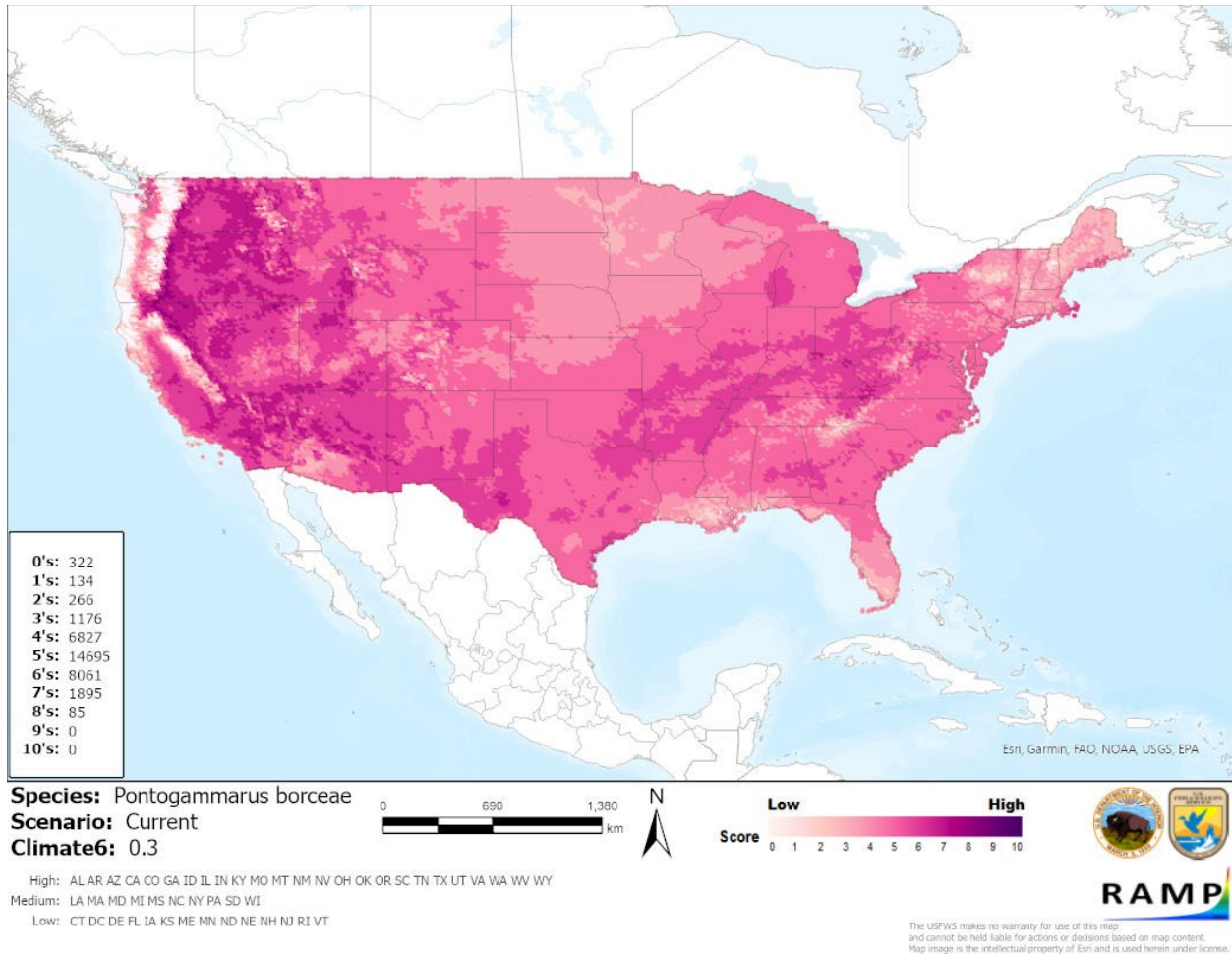


Figure 3. Map of RAMP (Sanders et al. 2021) climate matches for *Pontogammarus borceae* in the contiguous United States based on source locations reported in Stock et al. (1998) and Mirzajani et al. (2011). Counts of climate match scores are tabulated on the left. 0/Light Pink = Lowest match, 10/Dark Purple = Highest match.

The High, Medium, and Low Climate match Categories are based on the following table:

Climate 6: (Count of target points with climate scores 6-10)/ (Count of all target points)	Overall Climate Match Category
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
≥ 0.103	High

8 Certainty of Assessment

Information on *Pontogammarus borceae* is lacking. Georeferenced observations were available for a small portion of the species range. The remainder of the species range was described in very general terms and was too broad to use in estimating source points for the climate match. This reduces the certainty in the interpretation of the climate match. Additionally, the climate

match does not account for any salinity requirements of the species. No introductions were reported, therefore there is no information on invasiveness. The certainty of assessment is Low.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Pontogammarus borceae is an amphipod native to the Pontic area and the Caspian basin. Information is limited for this species but there are some studies suggesting potential uses in aquaculture. *P. borceae* has not been reported anywhere outside its native range resulting in a history of invasiveness classified as No Known Nonnative Populations. The climate match for the contiguous United States was High. Locally, much of the contiguous United States had a medium match except for areas along the mid and northern Pacific Coast, the Gulf Coast, and northern Great Plains and New England, which had a low match; and the Intermountain West and the Southwest, which had a high match. A large portion of the species' range was unable to be represented in the climate match due to a lack of georeferenced observations. Certainty of assessment is Low due to a lack of georeferenced locations and information regarding history of invasiveness. The overall risk assessment category for *Pontogammarus borceae* is Uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 4): No Known Nonnative Population**
- **Overall Climate Match Category (Sec. 7): High**
- **Certainty of Assessment (Sec. 8): Low**
- **Remarks/Important additional information:** No additional remarks.
- **Overall Risk Assessment Category: Uncertain**

10 Literature Cited

Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 11.

Esri. 2021. ArcGIS Pro 2.9.4. Redlands, California: Environmental Systems Research Institute. Map data from Esri.

Lowry J. 2010. *Pontogammarus borceae* Carausu, 1943. World Register of Marine Species. Available: <https://www.marinespecies.org/aphia.php?p=taxdetails&id=550250> (February 2022).

Mirzajani AR, Sayadrahim M, Sari A. 2011. Reproductive Traits of Some Amphipods (Crustacea: Peracarida) in Different Habitats of Iran and Southern Caspian Sea. International Journal of Zoology 2011:598504.

[OIE] World Organisation for Animal Health. 2022. OIE-listed diseases, infections and infestations in force in 2022. Available: <https://www.oie.int/en/what-we-do/animal-health-and-welfare/animal-diseases/> (February 2022).

Sanders S, Castiglione C, Hoff M. 2021. Risk Assessment Mapping Program: RAMP. Version 4.0. U.S. Fish and Wildlife Service.

Stock JH, Mirzajani AR, Vonk R, Naderi S, Kiabi BH. 1998. Limnic and Brackish Water Amphipoda (Crustacea) From Iran. *Beaufortia* 48(9):173–234.

11 Literature Cited in Quoted Material

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.

Carausu S, Dobreanu E, Manolache C. 1955. Amphipoda Forme Salmastre Si De Apa Dulce. *Fauna Republici Populare Romine. Crustacea. IV. Fascicula 4.*

Mirzajani AR. 2009. Adaptation and use of amphipoda in fishculture ponds in order to increase fish production. Agricultural Research and Education Organization.