Dikerogammarus oskari (an amphipod, no common name)

Ecological Risk Screening Summary

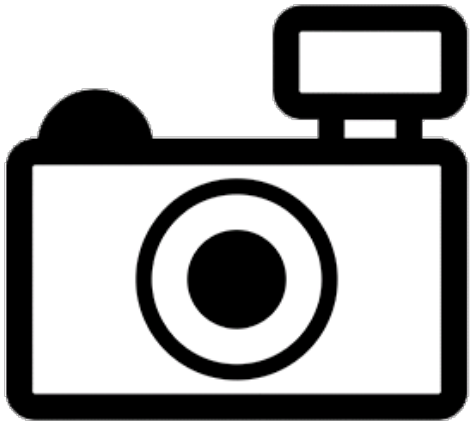
U.S. Fish & Wildlife Service, December 2021

Revised, January 2022

Web Version, 10/11/2022

Organism Type: Crustacean

Overall Risk Assessment Category: Uncertain



1 Native Range and Status in the United States

Native Range

According to Mirzoev et al. (2017), *Dikerogammarus oskari* is found in the southern Caspian Sea near Azerbaijan.

Status in the United States

No records of *Dikerogammarus oskari* in trade or in the wild in the United States were found.

Means of Introductions in the United States

No records *Dikerogammarus oskari* in the wild in the United States were found.

Remarks

Native range information was derived from sampling locations in the southern Caspian Sea described by Mirzoev et al. (2017).

From Platvoët (2007):

"Jazdzewski (pers. comm.) pointed out that in the Atlas of the Caspian Sea Invertebrates (Birstein & Romanova, 1968) the species [*Dikerogammarus villosus*] is not mentioned at all. Birstein was not convinced of the validity of *D. villosus* as a distinct taxon, but listed two other species, *D. aralensis* (Uljanov, 1875) and *D. oskari* Birstein, 1945, instead. Since the descriptions lacked much detail and the type material is most probably lost, we can never be certain of possible synonymy."

Additional information for *Dikerogammarus oskari* was found during this assessment in languages other than English.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From Horton et al. (2022):

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

“Status accepted

Rank Species”

Size, Weight, and Age Range

No information on size, weight, or age range was found for *Dikerogammarus oskari.*

Environment

From Horton et al. (2022):

“marine”

Climate

No information on climate was found for *Dikerogammarus oskari*.

Distribution Outside the United States

Native

According to Mirzoev et al. (2017), *Dikerogammarus oskari* is found in the southern Caspian Sea near Azerbaijan.

Introduced

No records of introductions were found for *Dikerogammarus oskari.*

Means of Introduction Outside the United States

No records of introductions were found for *Dikerogammarus oskari*.

Short Description

From Väinölä et al. (2008):

"[…] *Dikerogammarus oskari* Birstein (size ca. 20 mm; from Barnard & Barnard, 1983). The head is followed by 7 + 3+ 3 pereional + pleonal + urosomal segments. The appendages shown include antennae 1 and 2, mandibular palp, maxillipede, gnathopods 1 and 2 (=pereiopods 1,2), pereiopods 3–7, of which two are directed backwards, three forwards (hence, amphi podos, or both legs), three pleopods, and finally three uropods and a terminal telson"

From Copilaș-Ciocianu and Sidorov (in press):

"Uropod 3 exopod without spines […] *D. oskari*"

Biology

According to Mirzoev et al. (2017), *Dikerogammarus oskari* was detected in the following biotopes in the shelf area of the South Caspian: "shelly silt, silty-sand, and clayey-silt."

According to Copilaș-Ciocianu and Sidorov (in press), *D. oskari* is known from water depths of 35 to 197 meters.

Human Uses

No information on human uses was found for *Dikerogammarus oskari.*

Diseases

No records of OIE-reportable diseases (OIE 2021) were found for *Dikerogammarus oskari.*

No information on diseases was found for *Dikerogammarus oskari*.

Threat to Humans

No information on threats to humans was found for *Dikerogammarus oskari*.

3 Impacts of Introductions

Dikerogammarus oskari has not been reported as introduced or established anywhere in the world outside of its native range; therefore there is no information on impacts of introduction.

4 History of Invasiveness

No reports of introductions of *Dikerogammarus oskari* outside its native range were found. Therefore, the history of invasiveness is No Known Nonnative Population.

5 Global Distribution

Figure 1. Known global distribution of *Dikerogammarus oskari*. Georeferenced occurrences have not been reported for *D. oskari*. According to Mirzoev et al. (2017), *D. oskari* is found in the southern Caspian Sea (red) near Azerbaijan. Map from Google Earth (2021).

6 Distribution Within the United States

No records of *Dikerogammarus oskari* in the wild in the United States were found.

7 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Dikerogammarus oskari* in the contiguous United States was generally medium with high matches occurring primarily in portions of the Intermountain West. Small isolated portions of western Texas and central Appalachia also had high matches. Low matches were found in areas along the Pacific Coast and Cascade-Sierra Mountains, portions of the Rocky Mountains, Upper Midwest, Northeast, Gulf Coast and peninsular Florida. The overall Climate 6 score (Sanders et al. 2021; 16 variables; Euclidean distance) was 0.243, High (scores greater than or equal to 0.103, are classified as

high). Alabama, Arkansas, Arizona, California, Georgia, Idaho, Illinois, Indiana, Kentucky, Missouri, New Mexico, Nevada, Ohio, Oklahoma, Oregon, South Carolina, Tennessee, Texas, Utah, Virginia, Washington, and West Virginia had high individual scores. Colorado, Louisiana, Massachusetts, Maryland, Michigan, Mississippi, Montana, North Carolina, New York, Pennsylvania, and Wisconsin had medium individual scores. All other States had low individual scores. The climate match was based on generalized occurrences reported by Mirzoev et al. (2017) because no georeferenced occurrences were available. *D*. *oskari* is only known from brackish water associated with the Caspian Sea. No information was found characterizing this species' ability to survive in freshwater. The climate match does not account for salinity tolerance. It is uncertain if *D. oskari* could become established in portions of the United States where the climate match was high, but only freshwater habitat exists.

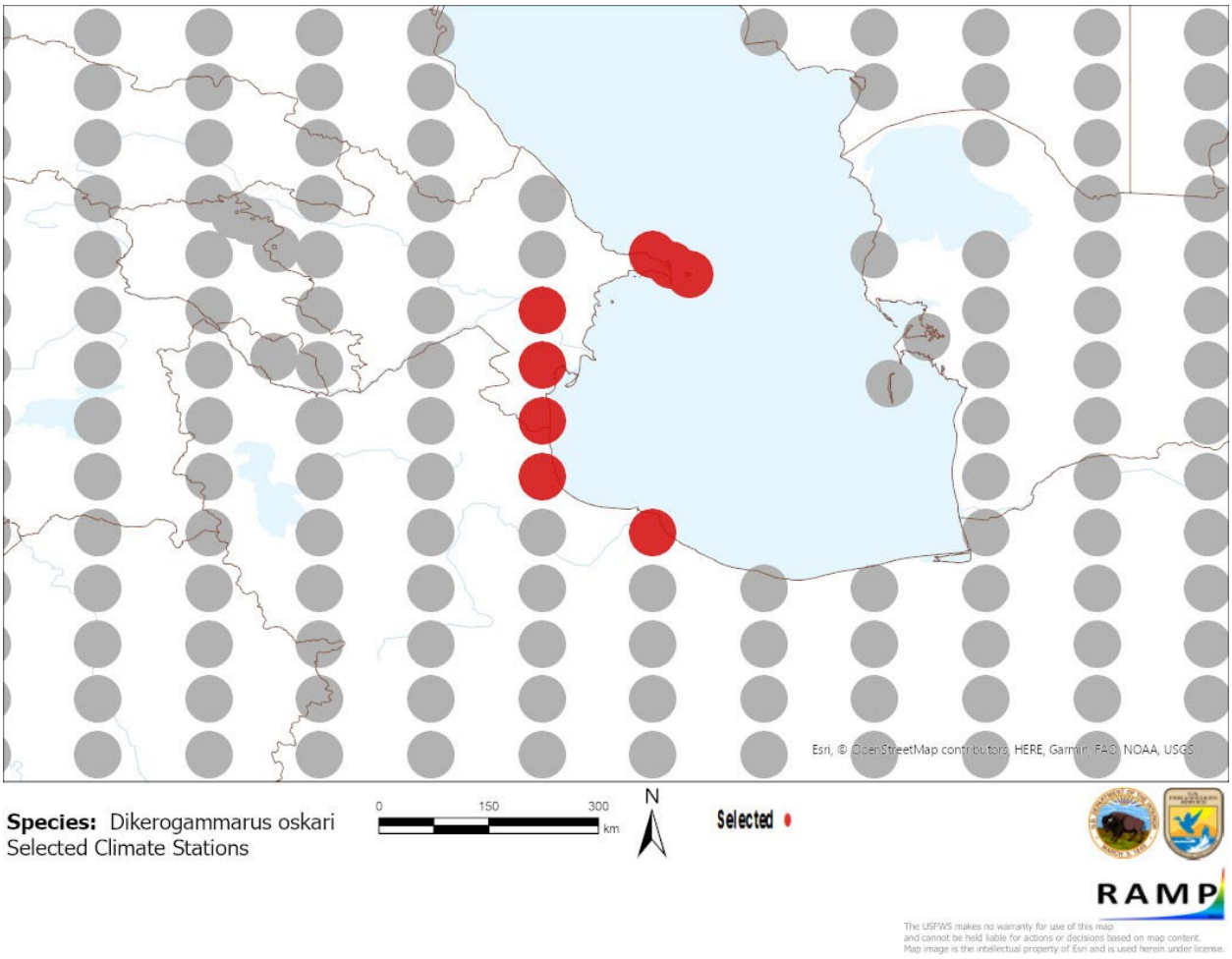


Figure 2. RAMP (Sanders et al. 2021) source map showing weather stations in the Caspian Sea region selected as source locations (red; Azerbaijan and Iran) and non-source locations (gray) for *Dikerogammarus oskari* climate matching. Source locations are associated with the southwestern portion of the Caspian Sea based on generalized occurrences reported by Mirzoev et al. (2017). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

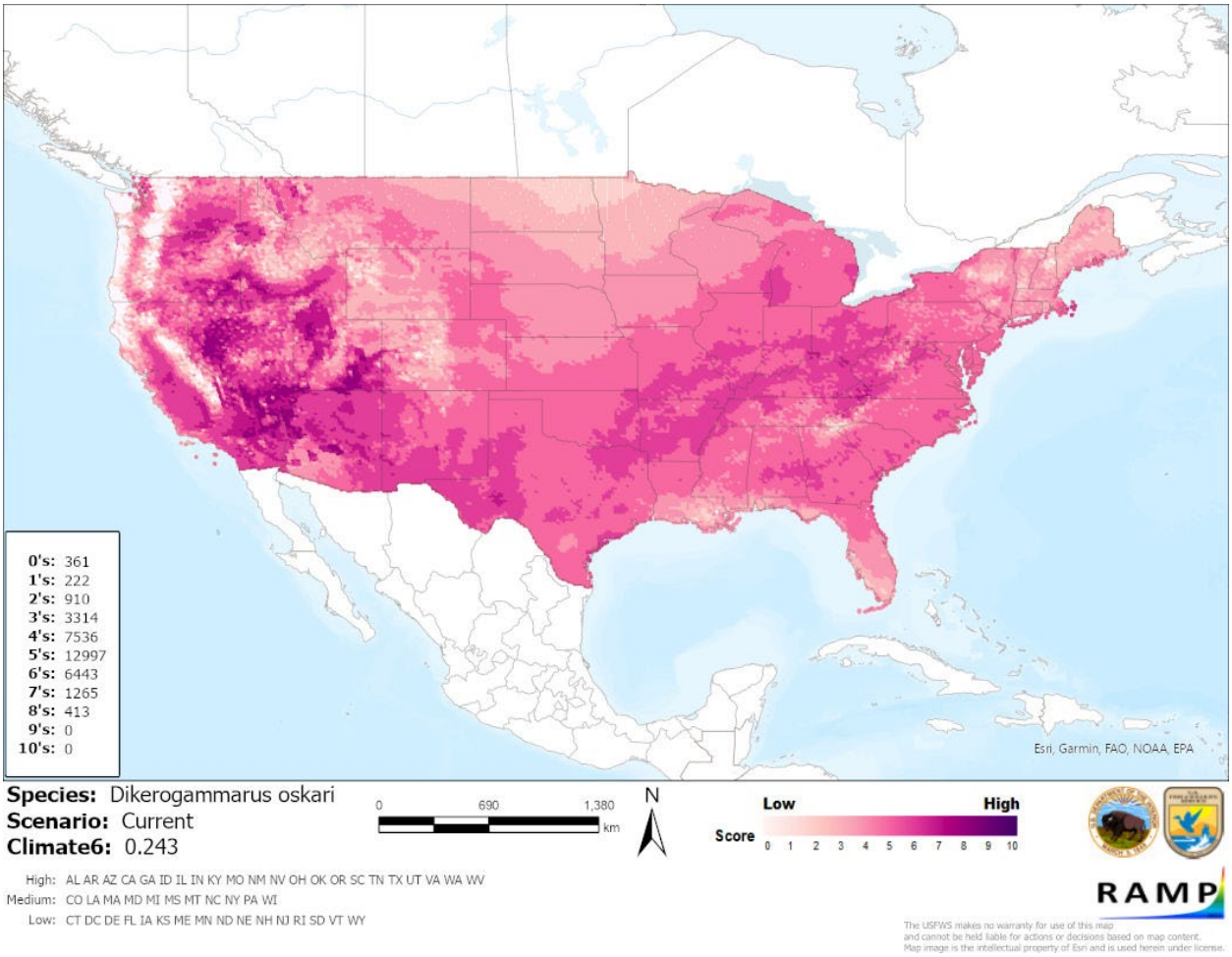


Figure 3. Map of RAMP (Sanders et al. 2021) climate matches for *Dikerogammarus oskari* in the contiguous United States based on generalized occurrences reported by Mirzoev et al. (2017). Counts of climate match scores are tabulated on the left. 0/Pale Pink = Lowest match, 10/Dark Purple = Highest match.

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≤X≤0.005	Low
0.005<X<0.103	Medium

Climate 6: (Count of target points with climate scores 6-10)/ (Count of all target points)	Overall Climate Match Category
≥0.103	High

8 Certainty of Assessment

The certainty of this assessment is low. Biological information for *Dikerogammarus oskari* was extremely limited and no georeferenced occurrences were found. The native range of this species is not well described in the literature. As such, the climate matching analysis is based on generalized occurrences reported by Mirzoev et al. (2017) and may underestimate potential climate matches with the contiguous United States. Additionally, *D. oskari* is only known from brackish water associated with the Caspian Sea. While labeled as a 'sea' the Caspian Sea is typically classified as brackish water. No information was found characterizing this species' ability to survive in freshwater. It is uncertain if *D. oskari* could become established in portions of the United States where the climate match was high, but only freshwater habitat exists. There were no records of introductions found, thus impacts of introductions are unknown.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Dikerogammarus oskari is an amphipod that has only been reported from the southern Caspian Sea, near Azerbaijan and Iran. Little information is available for this species and georeferenced occurrences are currently lacking. *D. oskari* has not been reported anywhere outside of its native distribution, therefore, history of invasiveness is classified as No Known Nonnative Population. The climate match for the contiguous United States was categorically High with the highest matches occurring in the Intermountain West. However, *D. oskari* is only known from brackish water associated with the Caspian Sea. The climate match does not account for salinity tolerance. It is uncertain if *D. oskari* could become established in portions of the United States where the climate match was high, but only freshwater habitat exists. Further, the climate match was based on generalized occurrences because no georeferenced occurrences were available. The certainty of this assessment is Low due to a lack of information. The overall risk assessment category for *D. oskari* 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.

Copilaș-Ciocianu D, Sidorov D. 2022.Taxonomic, ecological and morphological diversity of Ponto-Caspian gammaroidean amphipods: a review. Organisms Diversity & Evolution. https://doi.org/10.1007/s13127-021-00536-6. [in press]

Google. 2021. Google Earth desktop. Map data from SIO, NOAA, U.S. Navy, NGA, GEBCO, Landsat/Copernicus.

Horton T, Lowry J, De Broyer C, Bellan-Santini D, Coleman CO, Corbari L, Costello MJ, Daneliya M, Dauvin J-C, Fišer C, Gasca R, Grabowski M, Guerra-García JM, Hendrycks E, Hughes L, Jaume D, Jazdzewski K, Kim Y-H, King R, Krapp-Schickel T, LeCroy S, Lörz A-N, Mamos T, Senna AR, Serejo C, Sket B, Souza-Filho JF, Tandberg AH, Thomas JD, Thurston M, Vader W, Väinölä R, Vonk R, White K, Zeidler W. 2022. *Dikerogammarus oskari* Birstein, 1945. World Register of Marine Species. Available: https://www.marinespecies.org/aphia.php?p=taxdetails&id=489982 (January 2022).

Mirzoev GS, Alekperov LH. 2017. Zoobenthos distribution on biotope in the shelf zone of the Azerbaijan sector of the South Caspian. Journal of Entomology and Zoology Studies 5(2):953–959.

[OIE] World Organisation for Animal Health. 2021. OIE-listed diseases, infections and infestations in force in 2021. Available: http://www.oie.int/animal-health-in-the-world/oie-listed-diseases-2021/ (December 2021).

Platvoët D. 2007. *Dikerogammarus villosus* (Sowinsky, 1894), an amphipod with bite. The relationship between morphology, behaviour, micro-distribution and impact of this invading crustacean. Doctoral thesis. Amsterdam: University of Amsterdam.

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

Väinölä R, Witt JDS, Grabowski M, Bradbury JH, Jazdzewski K, Sket B. 2008. Global diversity of amphipods (Amphipoda; Crustacea) in freshwater. Hydrobiologia 595:241–255.

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.

Barnard JL, Barnard CM. 1983. Freshwater Amphipoda of the world. Mt. Vernon, Virginia: Hayfield Associates.

Birstein YA, Romanova NN. 1968. Amphipoda. Pages 241–289 in Birstein YA, Vinogradova LG, Kondakova NN, editors. Atlas bespozvonochnykh Kaspiiskogo moray. Moscow: Pishevaya Promyshlennost. (In Russian.)