

Charal (*Chirostoma jordani*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, February 2011
Revised, March 2019
Web Version, 10/17/2019

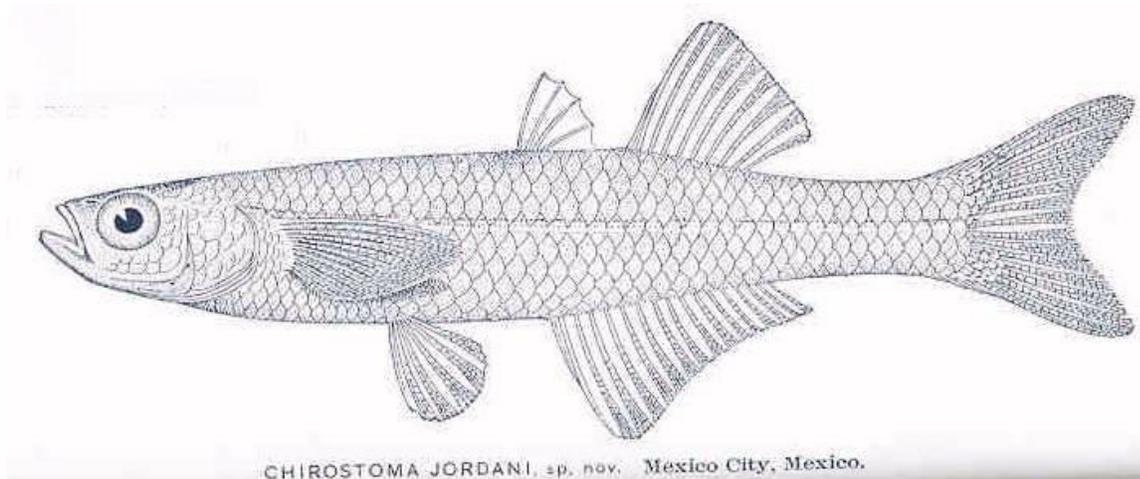


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1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2019):

“North America: central Mexico”

From Nico (2019):

“Central Mexico, Lago de Chapala and the Valley of Mexico (Barbour 1973; Contreras and Escalante 1984)”

Status in the United States

From Froese and Pauly (2019):

“Has been introduced unsuccessfully in Texas.”

Means of Introductions in the United States

From Nico (2019):

“Intentionally stocked by the Mexican federal government into two Rio Grande reservoirs, apparently with the hope of establishing a population that would serve as a source of food for local human residents (Courtenay and Hensley 1979a; Contreras and Escalante 1984). Introductions were made in the form of millions of fertilized eggs taken from Lake Chapala, Mexico (Courtenay and Hensley 1979a; C. Hubbs [University of Texas, Austin, TX.], personal communication to Courtenay; Courtenay, personal communication [Florida Atlantic University, Boca Raton, FL.]”).”

Remarks

Chirostoma jordani was intentionally introduced into the United States but any introduction failed to establish and there are no current wild populations in the United States.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

According to Fricke et al. (2019), *Chirostoma jordani* (Woolamn 1894) is the current valid name for this species.

From ITIS (2019):

“Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Actinopterygii
Class Teleostei
Superorder Acanthopterygii
Order Atheriniformes
Family Atherinopsidae
Subfamily Menidiinae
Genus *Chirostoma*
Species *Chirostoma jordani* Woolman, 1894”

Size, Weight, and Age Range

From Nico (2019):

“Size: 9.1 cm SL.”

Environment

From Froese and Pauly (2019):

“Freshwater, brackish; benthopelagic.”

Climate/Range

From Froese and Pauly (2019):

“Tropical”

Distribution Outside the United States

Native

From Froese and Pauly (2019):

“North America: central Mexico”

From Nico (2019):

“Central Mexico, Lago de Chapala and the Valley of Mexico (Barbour 1973; Contreras and Escalante 1984)”

Introduced

There are no wild established populations of *Chirostoma jordani* outside of its native range.

Means of Introduction Outside the United States

There are no wild established populations of *Chirostoma jordani* outside of its native range.

Short Description

No information available on a short description of *Chirostoma jordani*.

Biology

No information available on the biology of *Chirostoma jordani*.

Human Uses

From Nico (2019):

“[...] would serve as a source of food for local human residents (Courtenay and Hensley 1979a; Contreras and Escalante 1984).”

Diseases

There are no OIE reportable diseases (OIE 2019) recorded for *Chirostoma jordani*.

According to Poelen et al. (2014) *Chirostoma jordani* is host to *Paradilepis urceus*, *Valipora campylancristrota*, *Paradilepis caballeroi*, *Bothriocephalus acheilognathi*, and *Neoergasilus japonicas*.

Threat to Humans

From Froese and Pauly (2019):

“Harmless”

3 Impacts of Introductions

There are no impacts recorded for the failed establishment of *Chirostoma jordani* in Texas.

4 Global Distribution



Figure 1. Known global distribution of *Chirostoma jordani*. Locations in Mexico. Map from GBIF Secretariat (2019). The locations off the southern west coast and the most eastern point in Mexico were not used in the climate match because there is no evidence from scientific literature suggesting that *Chirostoma jordani* can be found in marine environments or has been found that far east.

5 Distribution Within the United States

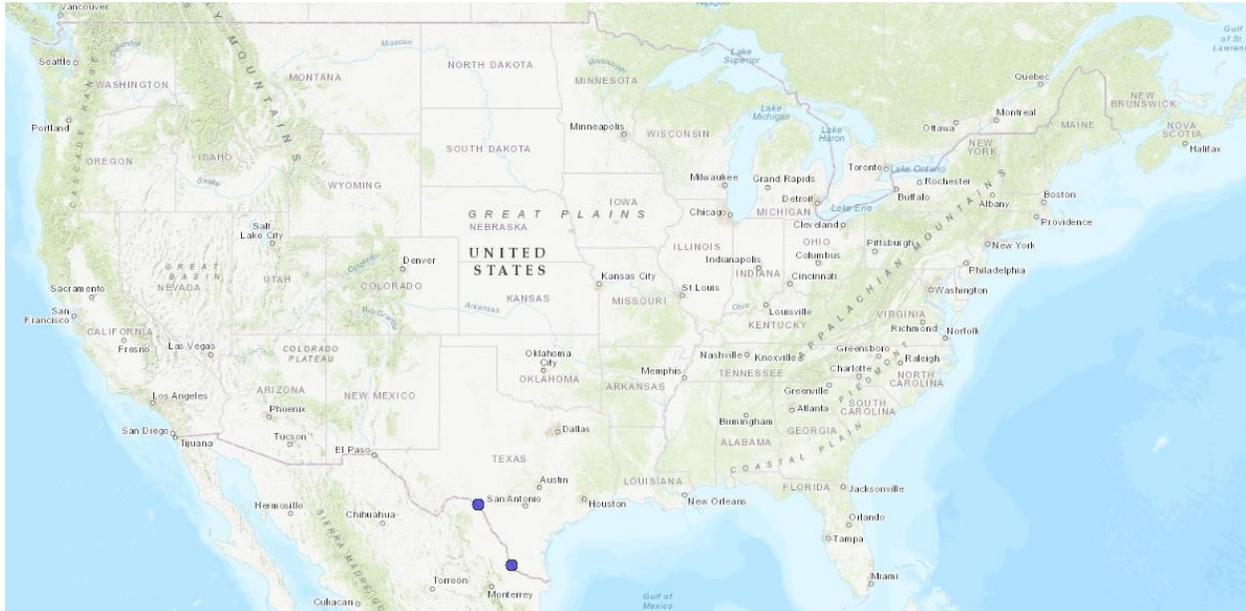


Figure 2. Known distribution of *Chirostoma jordani* in the United States. Map from BISON (2019). The points in Texas do not represent an established population, *Chirostoma jordani* was introduced in those areas but it has not become established (Nico et al. 2019).

6 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Chirostoma jordani* was low for the majority of the contiguous United States but there were some areas of medium and high climate match. Areas of medium match were mainly found in the southern portions of the Midwest, in southern California, and along the southern border. Southern Texas, southern Arizona, southern New Mexico, and southern Florida were the only areas with a high climate match. The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.091, medium (scores greater than 0.005, but less than 0.103, are classified as medium). All States had low individual Climate 6 scores except California, which had a medium score, and Arizona, Florida, New Mexico, and Texas, which had high scores.

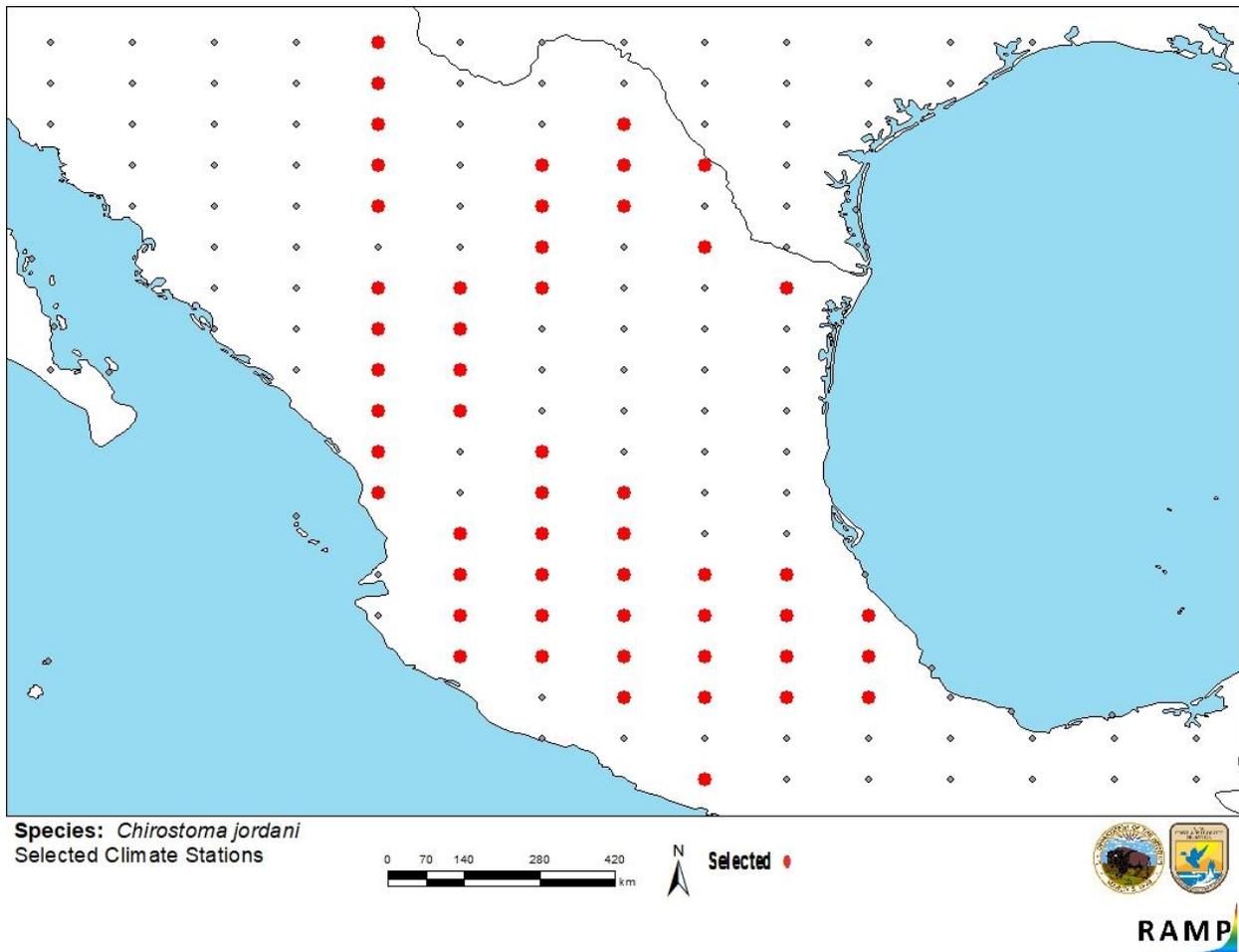


Figure 3. RAMP (Sanders et al. 2018) source map showing weather stations in Central America selected as source locations (red; Mexico) and non-source locations (gray) for *Chirostoma jordani* climate matching. Source locations from GBIF Secretariat (2019). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

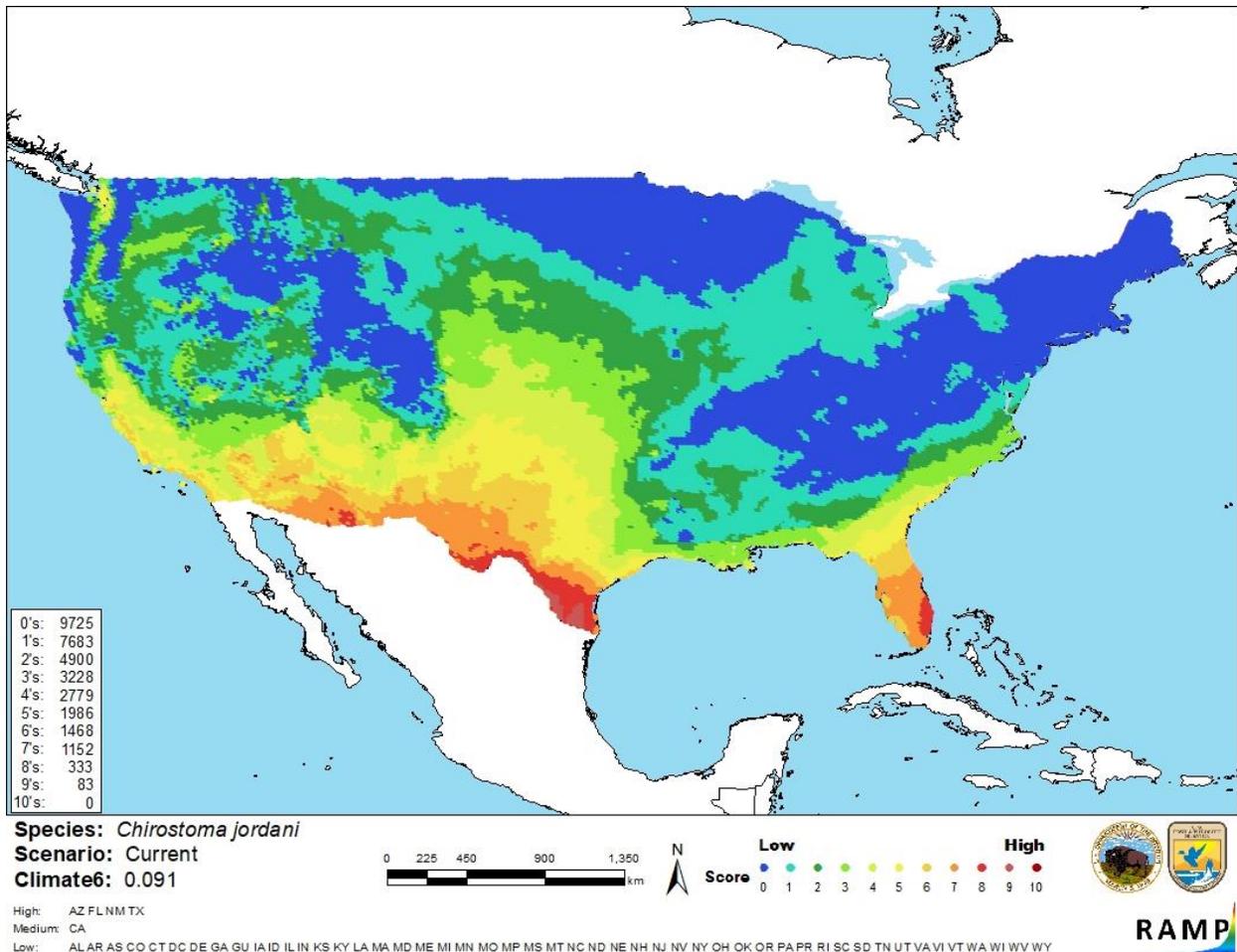


Figure 4. Map of RAMP (Sanders et al. 2018) climate matches for *Chirostoma jordani* in the contiguous United States based on source locations reported by GBIF Secretariat (2019). Counts of climate match scores are tabulated on the left. 0 = Lowest match, 10 = Highest match.

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

The certainty of assessment for *Chirostoma jordani* is low. There is minimal information available for this species. *Chirostoma jordani* has been introduced into the United States where it failed to establish.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Chirostoma jordani is a silverside fish native to central Mexico. There is very little information available on this species, with only a standard length of 9.1 cm being published. This history of invasiveness is uncertain. According to Froese and Pauly (2019), this species was intentionally introduced into Texas but it failed to establish. The climate match for the contiguous United States was medium, with medium and high match being located in the southern portions of the Midwest, and along the southern border. Each state had an individually low climate score except California, which had a medium climate score, and Arizona, Florida, New Mexico, and Texas, which had high climate scores. The certainty of assessment is low. The overall risk category for *Chirostoma jordani* is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): Uncertain**
- **Climate Match (Sec. 6): Medium**
- **Certainty of Assessment (Sec. 7): Low**
- **Remarks/Important additional information:** Failed to establish in Texas.
- **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.

BISON. 2019. Biodiversity Information Serving Our Nation (BISON). U.S. Geological Survey. Available: <https://bison.usgs.gov>. (March 2019).

Fricke, R., W. N. Eschmeyer, and R. van der Laan, editors. 2019. Eschmeyer's catalog of fishes: genera, species, references. Available: <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>. (March 2019).

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Nico, L. 2019. *Chirostoma jordani* Woolman, 1894. U.S. Geological Survey, Nonindigenous Aquatic Species Database, Gainesville, Florida. Available: <https://nas.er.usgs.gov/queries/FactSheet.aspx?SpeciesID=317>. (March 2019).

OIE (World Organisation for Animal Health). 2019. OIE-listed diseases, infections and infestations in force in 2019. Available: <http://www.oie.int/animal-health-in-the-world/oie-listed-diseases-2019/>. (October 2019).

Poelen, J. H., J. D. Simons, and C. J. Mungall. 2014. Global Biotic Interactions: an open infrastructure to share and analyze species-interaction datasets. *Ecological Informatics* 24:148–159.

Sanders, S., C. Castiglione, and M. Hoff. 2018. Risk assessment mapping program: RAMP, version 3.1. 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.

Barbour, C. D. 1973. The systematics and evolution of the genus *Chirostoma* Swainson (Pisces, Atherinidae). *Tulane Studies in Zoology and Botany* 18(3):97–141.

Contreras, S., and M. A. Escalante. 1984. Distribution and known impacts of exotic fishes in Mexico. Pages 102–130 in W. R. Courtenay, Jr. and J. R. Stauffer, editors. *Distribution, biology, and management of exotic fishes*. Johns Hopkins University Press, Baltimore, Maryland.

Courtenay, W. R., Jr., and D. A. Hensley. 1979a. Survey of introduced non-native fishes. Phase I report. *Introduced exotic fishes in North America: status 1979*. Report submitted to National Fishery Research Laboratory, U.S. Fish and Wildlife Service, Gainesville, Florida.