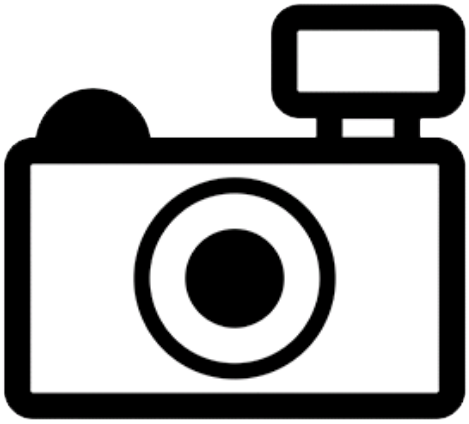
Mojarra de San Bulha (*Mayaheros ericymba*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, August 2011
Revised, October 2012, September 2018
Web Version, 1/2/2020



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1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2018):

"North America: Atlantic slope, San Bulha cenote [a groundwater-filled sinkhole], Mexico."

Status in the United States

This species has not been reported as introduced or established in the United States. There is no indication that this species is in trade in the United States.

Means of Introductions in the United States

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

Remarks

From Říčan et al. (2016):

"Hubbs (1935, 1936) described several, mostly geographically isolated subspecies of *Mayaheros urophthalmus*, often based on a limited number of specimens. Kullander (2003) elevated all the subspecies by Hubbs (1935, 1936) and all synonyms to species, however without any revision of the material of Hubbs or any additional material. Barrientos-Medina (2005) provided such an analysis in his M.Sc. thesis and he proposes the elevation of nine subspecies (*M. aguadae* [Hubbs, 1936]; *M. alborus* [Hubbs, 1936]; *M. amarus* [Hubbs, 1936]; *M. cienagae* [Hubbs, 1936]; *M. conchitae* [Hubbs, 1936]; *M. ericymba* [Hubbs, 1936]; *M. mayorum* [Hubbs, 1936]; *M. trispilus* [Hubbs, 1935]; *M. zebra* [Hubbs, 1936]) to species status and additionally proposes the existence of another eight new species."

Both the current valid name for this species, *Mayaheros ericymba*, and the synonym *Cichlasoma ericymba* were used when researching in preparation of this report.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2018):

"Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Actinopterygii
Class Teleostei
Superorder Acanthopterygii
Order Perciformes
Suborder Labroidei
Family Cichlidae
Genus *Cichlasoma*
Species *Cichlasoma ericymba* Hubbs, 1938"

From Fricke et al. (2018):

"Current status: Valid as *Mayaheros ericymba* (Hubbs 1938). Cichlidae: Cichlinae."

Size, Weight, and Age Range

From Froese and Pauly (2018):

"Max length : 12.2 cm SL male/unsexed; [Kullander 2003]"

Environment
From Froese and Pauly (2018):

"Freshwater; benthopelagic."

Climate/Range
From Froese and Pauly (2018):

"Tropical"

Distribution Outside the United States
Native
From Froese and Pauly (2018):

"North America: Atlantic slope, San Bulha cenote [a groundwater-filled sinkhole], Mexico."

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 Říčan et al. (2016):

"Genus *Mayaheros* gen. nov. Říčan & Piálek"

"Diagnosis. A monophyletic group of heroine cichlids of very generalized morphology, best diagnosed by a colour pattern of well developed evenly spaced bars virtually without midlateral blotches along midlateral line and also without a dominant midlateral blotch; distinct zebra-like breeding colours with black bars on a light background; lateral band (L-type) coloration pattern ontogeny; tip of the lower jaw projects distinctly in front of the upper jaw; maxilla extends to below the eye; reduced anteroventral wing and exposed median palatovomerine ligament; teeth pointed conical without second cusp on premaxillary and mandibular teeth of the 1st series; fold of lower lip continuous; second lower lip prominent. None of the above characters nor their combination is however unique, these being some of the most generalized cichlids in Middle America."

Biology
No information available.

Human Uses
No information available.

Diseases

Moravec et al. (2012) report *M. ericymba* (as *C. ericymba*) as a host for the nematode parasite *Rhabdochona kidderi*.

From Moravec et al. (2012):

"To date, *R. kidderi* has been reported from very many fish species belonging to different orders and families, mostly in Mexico (see Salgado-Maldonado, 2006, 2008) but also in Nicaragua (Aguirre Macedo et al., 2001; González-Solís & Jiménez-García, 2006), Costa Rica (Sandlund et al., 2010) and Texas, USA (Moravec & Huffman, 1988) […]"

"However, it is not always apparent from the published data whether or not all these hosts harboured fully-adult, egg-producing specimens or only larvae or juveniles. Neither can a misidentification of the species of *Rhabdochona* be excluded."

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

Threat to Humans

From Froese and Pauly (2018):

"Harmless"

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 distribution of *Mayaheros ericymba*, reported from the Yucatán Peninsula of Mexico. Map from GBIF Secretariat (2018).

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 6 score (Sanders et al. 2014; 16 climate variables; Euclidean distance) for the contiguous United States was 0.001, which is a low climate match. A Climate 6 score of 0.005 or less indicates a low climate match. The climate match was categorically low in every state in the contiguous United States except for Texas, where it was medium. Although the climate match was low in Florida, there was an area of medium climate match in southern Florida.

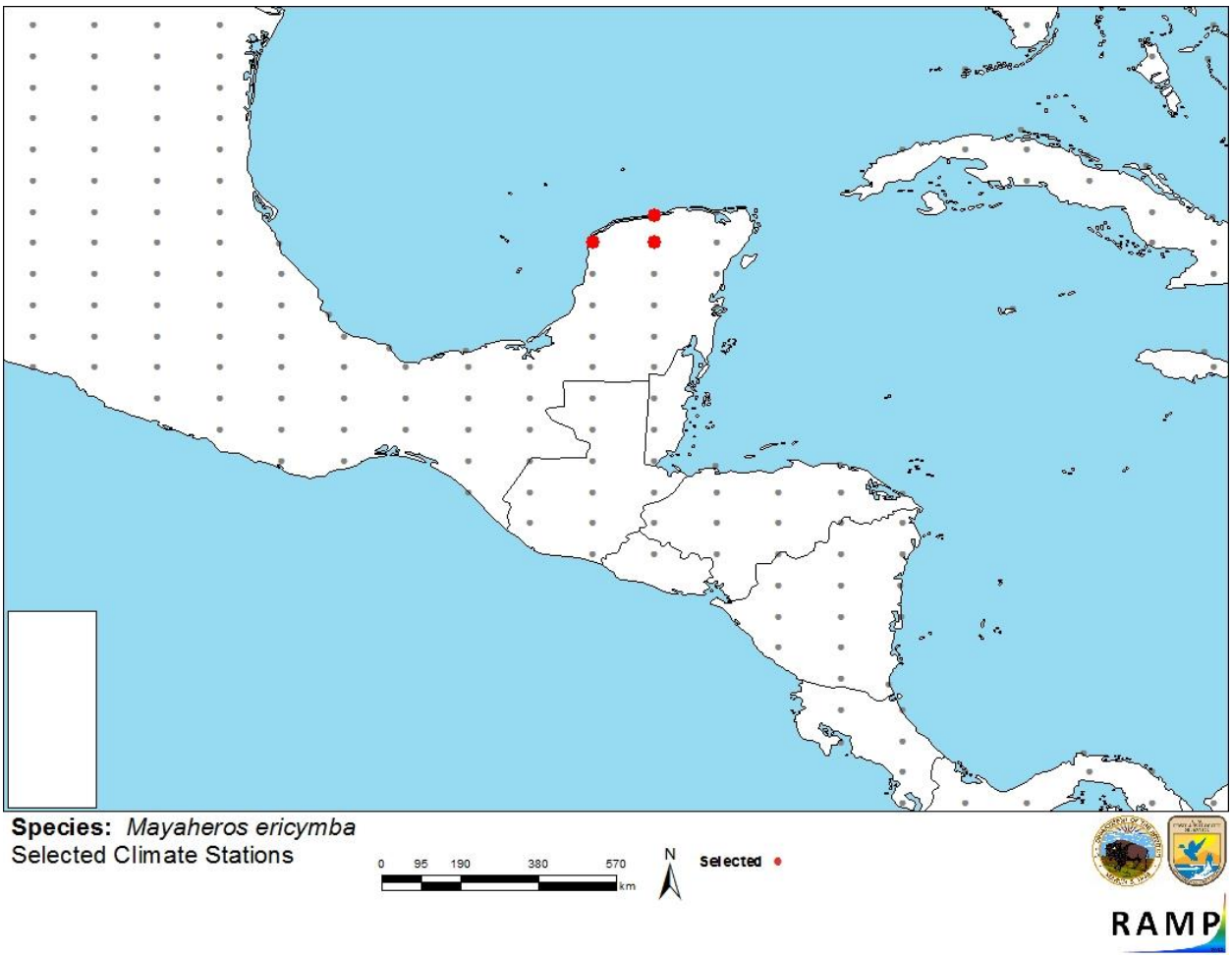

Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red; Mexico) and non-source locations (gray) for *Mayaheros ericymba* climate matching. Source locations from GBIF Secretariat (2018).

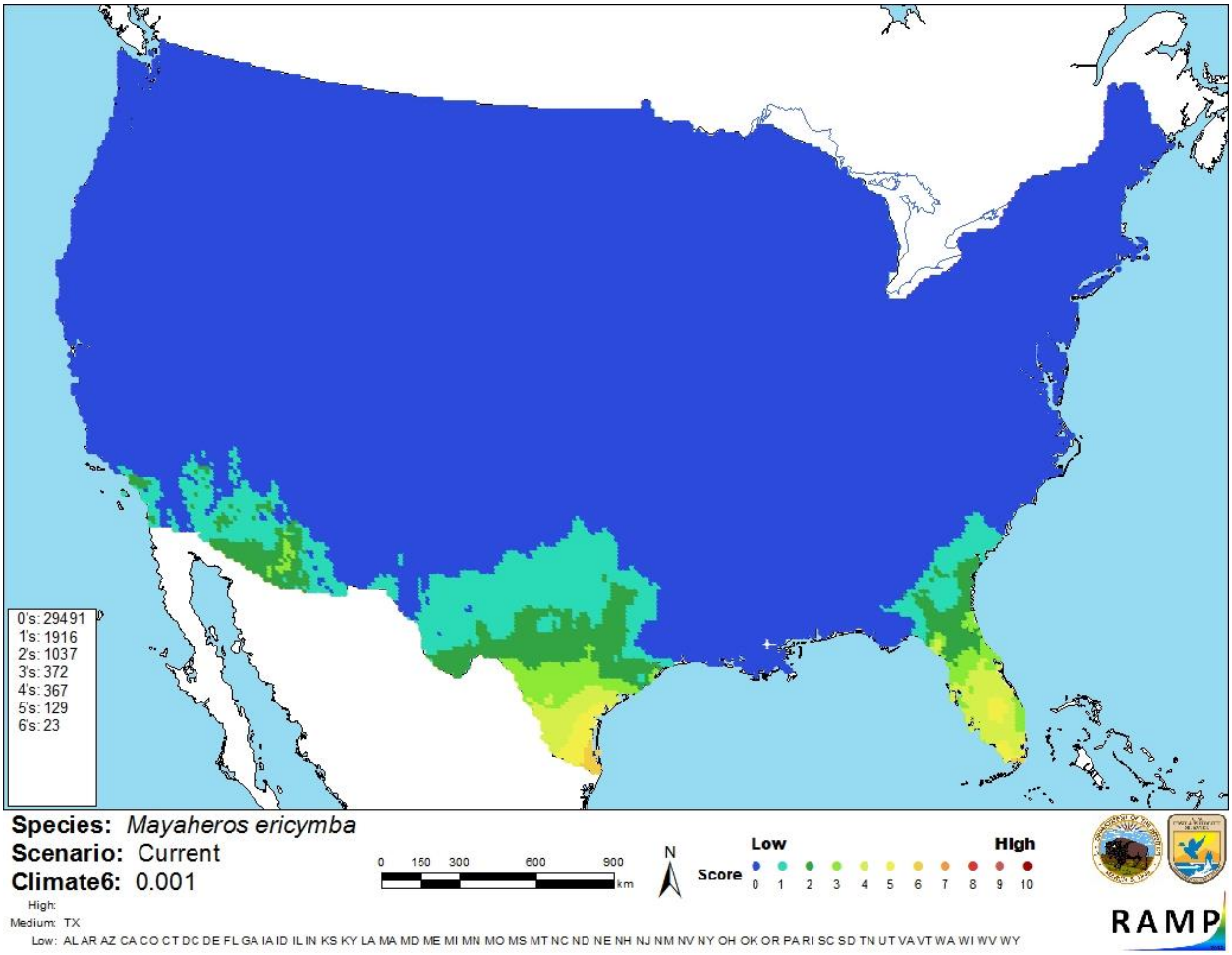

Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *Mayaheros ericymba* in the contiguous United States based on source locations reported by GBIF Secretariat (2018). Counts of climate match scores are tabulated on the left. 0= Lowest match, 10=Highest match.

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

There is almost no information available about *Mayaheros ericymba*. There are no documented introductions of this species outside of its native range, so no information is available from which to base an assessment of the invasive potential of this species. Certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Mayaheros ericymba, the Mojarra de San Bulha, is a cichlid species known only from the San Bulha cenote in southern Mexico. This species has never been reported as introduced or established outside of its native range. *M. ericymba* has a low climate match with the contiguous United States, and a medium climate match in Texas specifically. The certainty of this assessment is low because there is very little information available about this species. The 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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Moravec, F., G. Salgado-Maldonado, D. González-Solís, and J. M. Caspeta-Mandujano. 2012. Host–parasite relationships of *Rhabdochona kidderi* Pearse, 1936 (Nematoda: Rhabdochonidae) in fishes of the Lacantún River in the Lacandon rain forest of Chiapas State, southern Mexico, with a key to Mexican species of *Rhabdochona* Railliet, 1916. Systematic Parasitology 82(1):1-12.

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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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Salgado-Maldonado, G. 2006. Checklist of helminth parasites of freshwater fishes from Mexico. Zootaxa 1324:1–357.

Salgado-Maldonado, G. 2008. Helminth parasites of freshwater fish from Central America. Zootaxa 1915:29-53.

Sandlund, O. T., R. H. Daverdin, A. Choudhury, D. R. Brooks, and O. H. Diserud. 2010. A survey of freshwater fishes and their macroparasites in the Guanacaste Conservation Area (ACG), Costa Rica. Norwegian Institute for Nature Research, NINA Report 635, Trondheim, Norway.