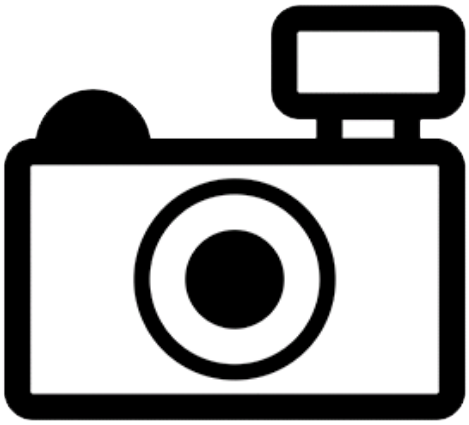
Trichomycterus variegatus (a catfish, no common name)
Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, February 2017
Revised, March 2018
Web Version, 11/1/2019



1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2017):

"South America: upper São Francisco River basin in Brazil."

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, according to the literature and a search of online aquarium retailers.

From Arizona Secretary of State (2006):

"Fish listed below are restricted live wildlife [in Arizona] as defined in R12-4-401. […] South American parasitic catfish, all species of the family Trichomycteridae and Cetopsidae […]"

From Dill and Cordone (1997):

"[…] At the present time, 22 families of bony and cartilaginous fishes are listed [as prohibited in California], e.g. all parasitic catfishes (family Trichomycteridae) […]"

From FFWCC (2019):

"Nonnative Conditional species (formerly referred to as restricted species) and Prohibited species are considered to be dangerous to Florida's native species and habitats or could pose threats to the health and welfare of the people of Florida. These species are not allowed to be personally possessed, but can be imported and possessed by permit for research or public exhibition; Conditional species may also be possessed by permit for commercial sales. Facilities where Conditional or Prohibited species are held must meet certain biosecurity criteria to prevent escape."

Trichomycterus variegatus is listed as a Prohibited species in Florida.

From Louisiana House of Representatives Database (2010):

"No person, firm, or corporation shall at any time possess, sell, or cause to be transported into this state [Louisiana] by any other person, firm, or corporation, without first obtaining the written permission of the secretary of the Department of Wildlife and Fisheries, any of the following species of fish: […] all members of the families […] *Trichomycteridae* (pencil catfishes) […]"

From Mississippi Secretary of State (2019):

"All species of the following animals and plants have been determined to be detrimental to the State's native resources and further sales or distribution are prohibited in Mississippi. No person shall import, sell, possess, transport, release or cause to be released into the waters of the state any of the following aquatic species or hybrids thereof.
[The list includes all species of] Family Trichomycteridae"

From Legislative Council Bureau (2018):

"Except as otherwise provided in this section and NAC 504.486, the importation, transportation or possession of the following species of live wildlife or hybrids thereof, including viable embryos or gametes, is prohibited [in Nevada]: […]
All species in the families Cetopsidae and Trichomycteridae"

From Utah DNR (2012):

"All species of fish listed in Subsections (2) through (30) are classified [in Utah] as prohibited for collection, importation and possession […]
Parasitic catfish (candiru, carnero) family Trichomycteridae (All species)"

Means of Introductions in the United States

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

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2017):

"Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Osteichthyes
Class Actinopterygii
Subclass Neopterygii
Infraclass Teleostei
Superorder Ostariophysi
Order Siluriformes
Family Trichomycteridae
Subfamily Trichomycterinae
Genus *Trichomycterus*
Species *Trichomycterus variegatus* Costa, 1992"

From Eschmeyer et al. (2017):

"Current status: Valid as *Trichomycterus variegatus* Costa 1992. Trichomycteridae: Trichomycterinae."

Size, Weight, and Age Range

From Ferrer and Malabarba (2011):

"*Trichomycterus variegatus*: […] 43.1–49.8 mm SL, […]"

From Froese and Pauly (2017):

"Max length : 4.0 cm male/unsexed; [de Pinna and Wosiacki 2003]"

Environment

From Froese and Pauly (2017):

"Freshwater; benthopelagic."

Climate/Range
From Froese and Pauly (2017):

"Tropical"

Distribution Outside the United States
Native
From Froese and Pauly (2017):

"South America: upper São Francisco River basin in Brazil."

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 Bockmann and Sazima (2004):

"[…] *T. variegatus* has blotches of deeper layer arranged in four ill-defined stripes, each of them sometimes interrupted and coalesced with the adjacent stripes […]"

"[…] most species of *Trichomycterus* have higher [pectoral fin ray] counts, usually I+7 (e.g. […] *T. variegatus*)"

"[…] the bases of the pelvic fins are distinctly spaced from each other."

Biology
No information available.

Human Uses
No information available.

Diseases
No OIE-reportable diseases (OIE 2019) have been documented for this species. No further information available.

Threat to Humans
From Froese and Pauly (2017):

"Harmless"

3 Impacts of Introductions

This species has not been reported as introduced or established outside of its native range, so no information is available on impacts of introduction.

The importation, possession, or trade of the parasitic catfish *T. variegatus* is prohibited or restricted in the following states: Arizona (Arizona Secretary of State 2006), California (Dill and Cordone 1997), Florida (FFWCC 2019), Louisiana (Louisiana House of Representatives Database 2010), Mississippi (Mississippi Secretary of State 2019), Nevada (Legislative Council Bureau 2018), and Utah (Utah DNR 2012).

4 Global Distribution

Figure 1. Known global distribution of *Trichomycterus variegatus*, reported from Brazil. Map from GBIF Secretariat (2019). The southernmost reported occurrence is outside the São Francisco River basin, which is the known established range of *T. variegatus*, so this occurrence was not used as a source location for climate matching.

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 match (Sanders et al. 2018; 16 climate variables; Euclidean Distance) was medium in southwestern peninsular Florida. Low matches occurred throughout the remaining contiguous United States. The Climate 6 score indicated that the contiguous United States has a low overall climate match. The Climate 6 score for *Trichomycterus variegatus* is 0.0. (Scores between 0.000

and 0.005, inclusive, are classified as low.) All States had low climate scores except for Florida, which had a medium climate score.

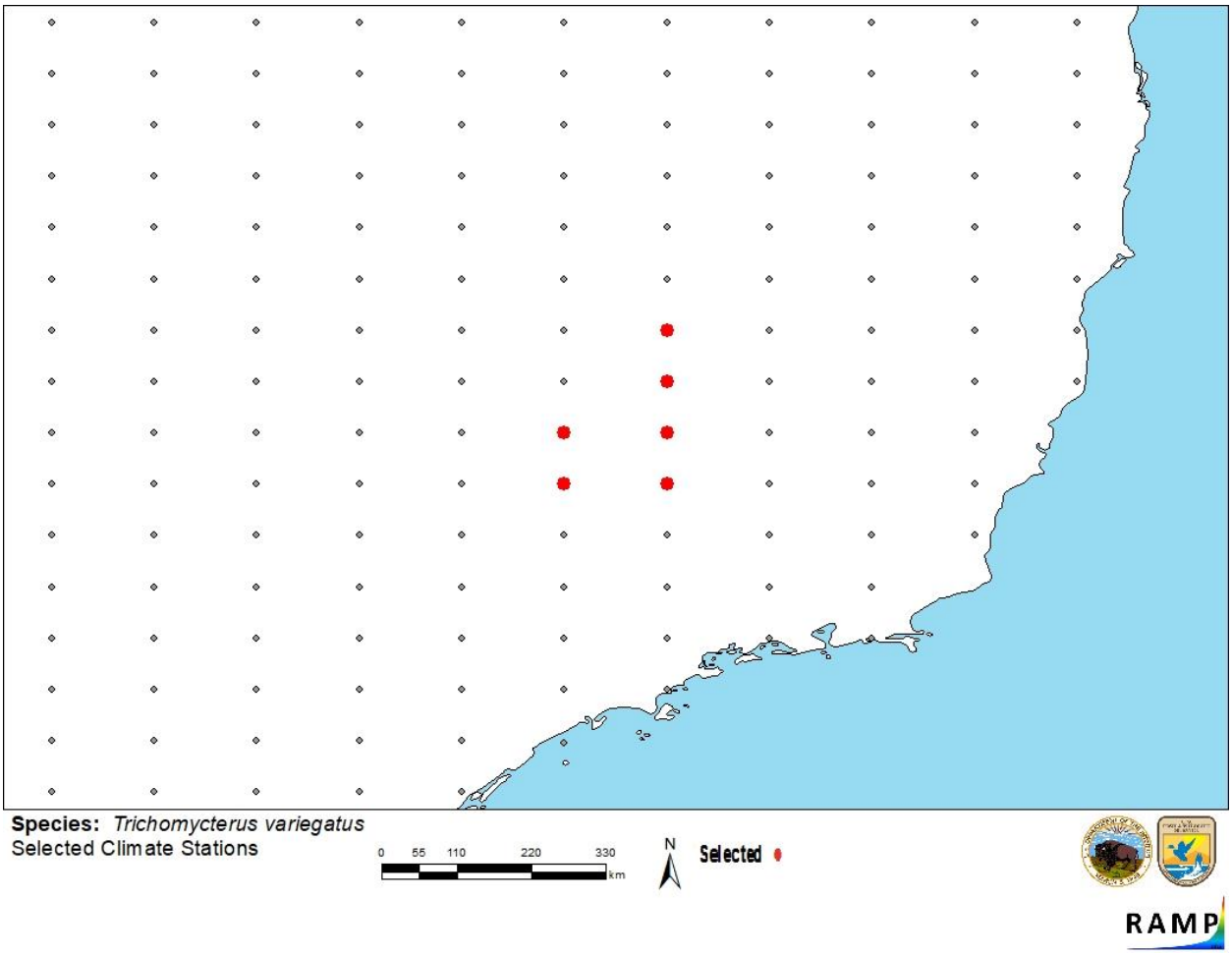


Figure 3. RAMP (Sanders et al. 2018) source map showing weather stations selected as source locations (red; Brazil) and non-source locations (gray) for *Trichomycterus variegatus* climate matching. Source locations from GBIF Secretariat (2019).

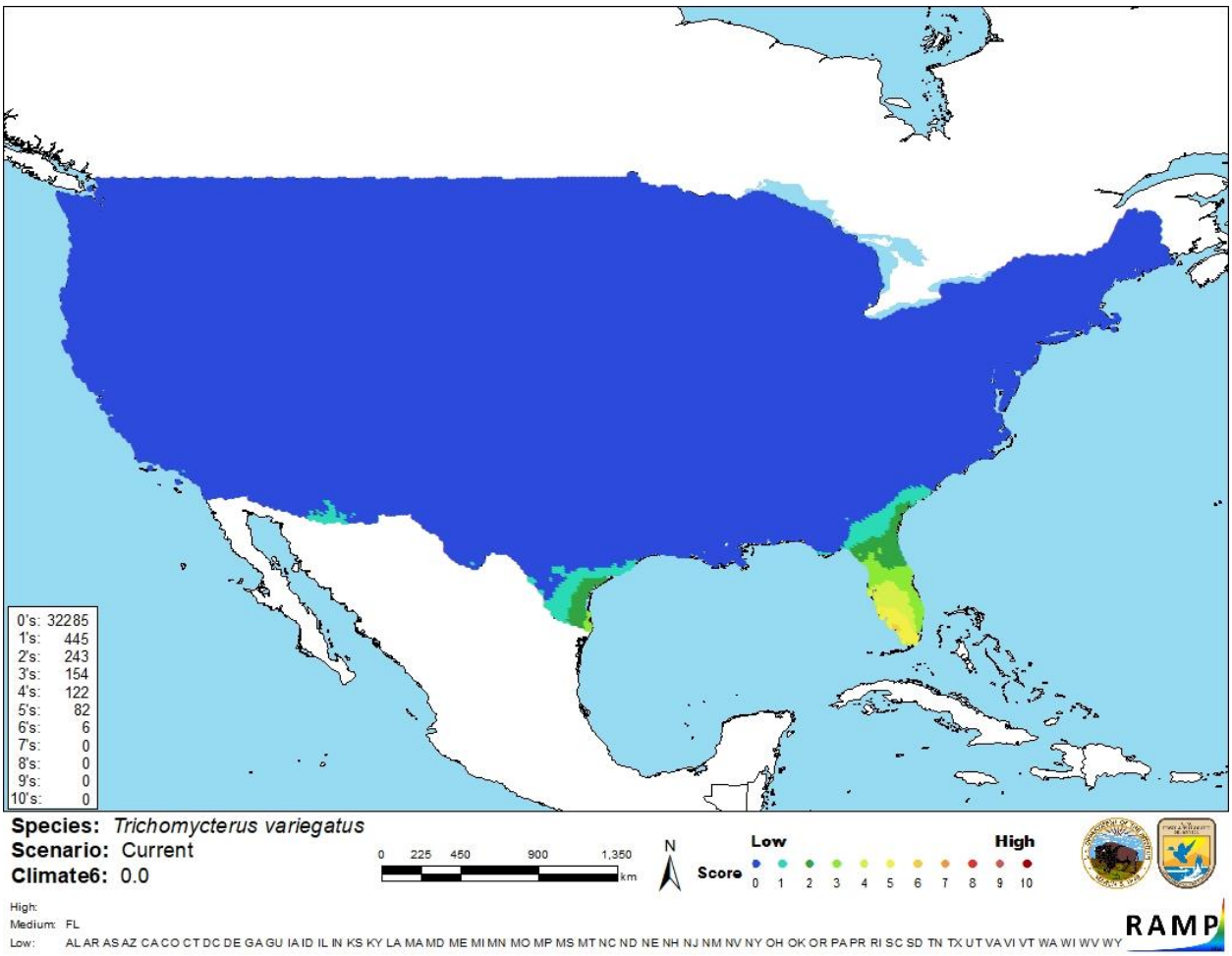


Figure 4. Map of RAMP (Sanders et al. 2018) climate matches for *Trichomycterus variegatus* in the contiguous United States based on source locations reported by GBIF Secretariat (2019). 0= Lowest match, 10= Highest match. Counts of climate match scores are tabulated on the left.

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≤X≤0.005	Low
0.005<X<0.103	Medium
≥0.103	High

7 Certainty of Assessment

Information on the biology and distribution of *T. variegatus* is not widely available. No introductions of this species outside of its native range have been documented. Therefore, there are no data on the impacts of introductions. Certainty of this assessment low due to lack of information.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Trichomycterus variegatus is a small parasitic catfish native to the São Francisco River basin in Brazil. History of invasiveness is uncertain because this species has not been documented outside of its native range. Several U.S. States prohibit or restrict the possession, transport, or trade of this species along with other members of the family Trichomycteridae. Certainty of this assessment low due to lack of information. *T. variegatus* has a low climate match with the contiguous United States. The overall risk posed by this species 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.

Arizona Secretary of State. 2006. Restricted live wildlife. Arizona Administrative Code, R12-4-406.

Bockmann, F. A., and I. Sazima. 2004. *Trichomycterus maracaya*, a new catfish from the upper rio Paraná, southeastern Brazil (Siluriformes: Trichomycteridae), with notes on the *T. brasiliensis* species-complex. Neotropical Ichthyology 2(2):61-74.

Dill, W. A., and A. J. Cordone. 1997. History and status of introduced fishes in California, 1871-1996. California Department of Fish and Game. Fish Bulletin 178.

Eschmeyer, W. N., R. Fricke, and R. van der Laan, editors. 2016. Catalog of fishes: genera, species, references. Available: http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp. (February 2017).

Ferrer, J., and L. R. Malabarba. 2011. A new *Trichomycterus* lacking pelvic fins and pelvic girdle with a very restricted range in southern Brazil (Siluriformes: Trichomycteridae). Zootaxa 2912:59-67.

FFWCC (Florida Fish and Wildlife Conservation Commission). 2019. Florida's nonnative fish and wildlife. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida. Available: https://myfwc.com/wildlifehabitats/nonnatives/. (November 2019).

Froese, R., and D. Pauly, editors. 2017. *Trichomycterus variegatus* (Costa 1992). FishBase. Available: http://www.fishbase.org/summary/58386. (February 2017).

GBIF Secretariat. 2019. GBIF backbone taxonomy: *Trichomycterus variegatus* (Costa 1992). Global Biodiversity Information Facility, Copenhagen. Available: http://www.gbif.org/species/2343158. (November 2019).

ITIS (Integrated Taxonomic Information System). 2016. *Trichomycterus variegatus* (Costa, 1992). Integrated Taxonomic Information System, Reston, Virginia. Available: https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=682277#null. (February 2017).

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Mississippi Secretary of State. 2019. Guidelines for aquaculture activities. Mississippi Administrative Code, Title 2, Part 1, Subpart 4, Chapter 11. Regulatory and Enforcement Division, Office of the Mississippi Secretary of State, Jackson, Mississippi.

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/. (August 2019).

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Utah DNR. 2012. R657-3 – collection, importation, transportation, and possession of animals. Utah Division of Natural Resources, Salt Lake City, Utah. Available: https://wildlife.utah.gov/hunting-in-utah/guidebooks/46-rules/rules-regulations/940-r657-3--collection-importation-transportation-and-possession-of-animals.html. (May 2018).

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.

de Pínna, M. C. C. and W. Wosiacki, 2003. Trichomycteridae (pencil or parasitic catfishes). Pages 270-290 *in* R. E. Reis, S. O. Kullander, and C. J. Ferraris, Jr., editors. Checklist of the freshwater fishes of South and Central America. EDIPUCRS, Porto Alegre, Brazil.