

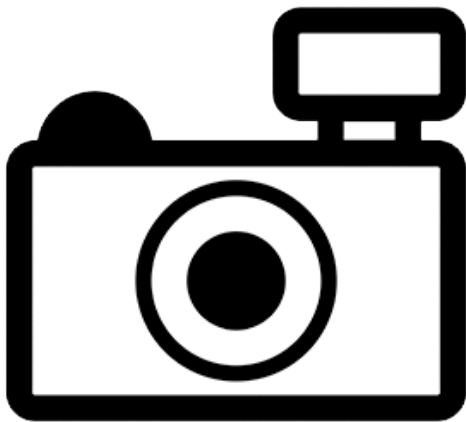
***Trichomycterus therma* (a catfish, no common name)**

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, December 2016

Revised, February 2018

Web Version, 2/28/2020



No Photo Available

1 Native Range and Status in the United States

Native Range

From Fernández and Miranda (2007):

“*Trichomycterus therma* n. sp. is known solely from the type locality situated within the limits of the man-made thermal bath of Miraflores, in the northern portion of the Department of Potosí, Bolivia.”

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.

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 therma 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 [Nevada Administrative Code] 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 documented as introduced or established in the United States.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From GBIF Secretariat (2016):

“KINGDOM Animalia
PHYLUM Chordata
CLASS Actinopterygii
ORDER Siluriformes
FAMILY Trichomycteridae
GENUS *Trichomycterus*
SPECIES *Trichomycterus therma*”

From Eschmeyer et al. (2016):

“Current status: Valid as *Trichomycterus therma* Fernández & Miranda 2007. Trichomycteridae: Trichomycterinae.”

Size, Weight, and Age Range

From Froese and Pauly (2016):

“Max length : 5.8 cm SL male/unsexed; [Fernández and Miranda 2007]”

Environment

From Fernández and Miranda (2007):

“*Trichomycterus therma* n. sp. inhabits a slightly sloping stream that arises from a spring and runs a short distance before emptying into the Río Tarapaya (Pilcomayo-Parana basin) at an elevation of c. 3600 m a.s.l. [...]. The clear water stream ranges between 1–1.5 m in width and 0.15–0.5 m in depth, and runs over clay and rock-pebble substrata with algae. This area has high geothermal activity. At the spring source, the water emerges at 50 to 60° C into a small pool, which drains c. 400 m away from the source into the stream where water temperature cools down to 37° C. The fishes occur mainly in the area where the water is 37° C and has a pH of 8.2.”

Climate/Range

From Froese and Pauly (2016):

“Tropical; 37°C - ? [Fernández and Miranda 2007]”

Distribution Outside the United States

Native

From Fernández and Miranda (2007):

“*Trichomycterus therma* n. sp. is known solely from the type locality situated within the limits of the man-made thermal bath of Miraflores, in the northern portion of the Department of Potosí, Bolivia.”

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 Froese and Pauly (2016):

“Dorsal soft rays (total): 14; Anal soft rays: 11; Vertebrae: 32. Can be easily distinguished from all other species of the genus *Trichomycterus* from western and southern South America by possessing an autapomorphic thickened transverse skin on the ventral surface of the head. Differs further from other congeners except *Trichomycterus corduvensis* from Argentina and *Trichomycterus tiraquae* from Bolivia by the combination of the following characters: presence of spatulate incisiform premaxillary teeth; presence of large and rounded papilla-like structures on the trunk of the body; the continuous segment of the laterosensory canal within the frontal with the presence of a segment between pores 2 and 6; and laterosensory canal on trunk with 4 to 6 pores. Can be differentiated from *Trichomycterus tiraquae* and *Trichomycterus corduvensis* by the shape of the maxilla, which has a short anterior process that is shorter than the main axis of the bone and is anteriorly oriented (vs. anterior process enlarged and equal to, or longer than the main axis of the bone and with an anterolateral orientation); mesethmoid shaft narrower than the width of the lateral cornua (vs. shaft equal to or wider than width of lateral cornua). Differ also from *Trichomycterus tiraquae* by having prepelvic length 58.7-61.0% of SL (vs. 56.6-57.6), head width 19.1-22.8% of SL (vs. 17.4-18.9); the submaxillary barbel length 23.9-37.5% of SL (vs. 43.3-54.8) [Fernández and Miranda 2007].”

Biology

From Fernández and Miranda (2007):

“Prior to this study, three specimens had been opened ventrally, allowing analysis of the stomach contents. The stomach contents of these three specimens consisted mainly of Diptera (mostly Chironomidae) and Coleoptera (Elmidae). Dipterans were the predominant group with a relative abundance of 95%.”

Human Uses

No information reported for this species.

Diseases

No OIE-reportable diseases (OIE 2020) have been documented for this species.

Threat to Humans

From Froese and Pauly (2016):

“Harmless”

3 Impacts of Introductions

This species has not been reported as introduced or established outside of its native range.

The importation, possession, or trade of the catfish *T. therma* 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 therma*, reported from Bolivia. Map from GBIF Secretariat (2016).

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

Note: *Trichomycterus therma* is native to a thermal stream where water temperatures are elevated above temperatures of nearby, non-thermal streams. Locations of geothermal activity or elevated water temperatures in the contiguous United States may be a better predictor of establishment probability for *T. therma* than the broad climatic patterns used in the climate matching analysis.

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean Distance) was low across much of the contiguous United States, with medium match in parts of New Mexico and coastal California. The Climate 6 score of *Trichomycterus therma* is 0.0, indicating a low overall climate match. (Scores between 0.000 and 0.005, inclusive, are classified as low.) All States had individually low climate scores.

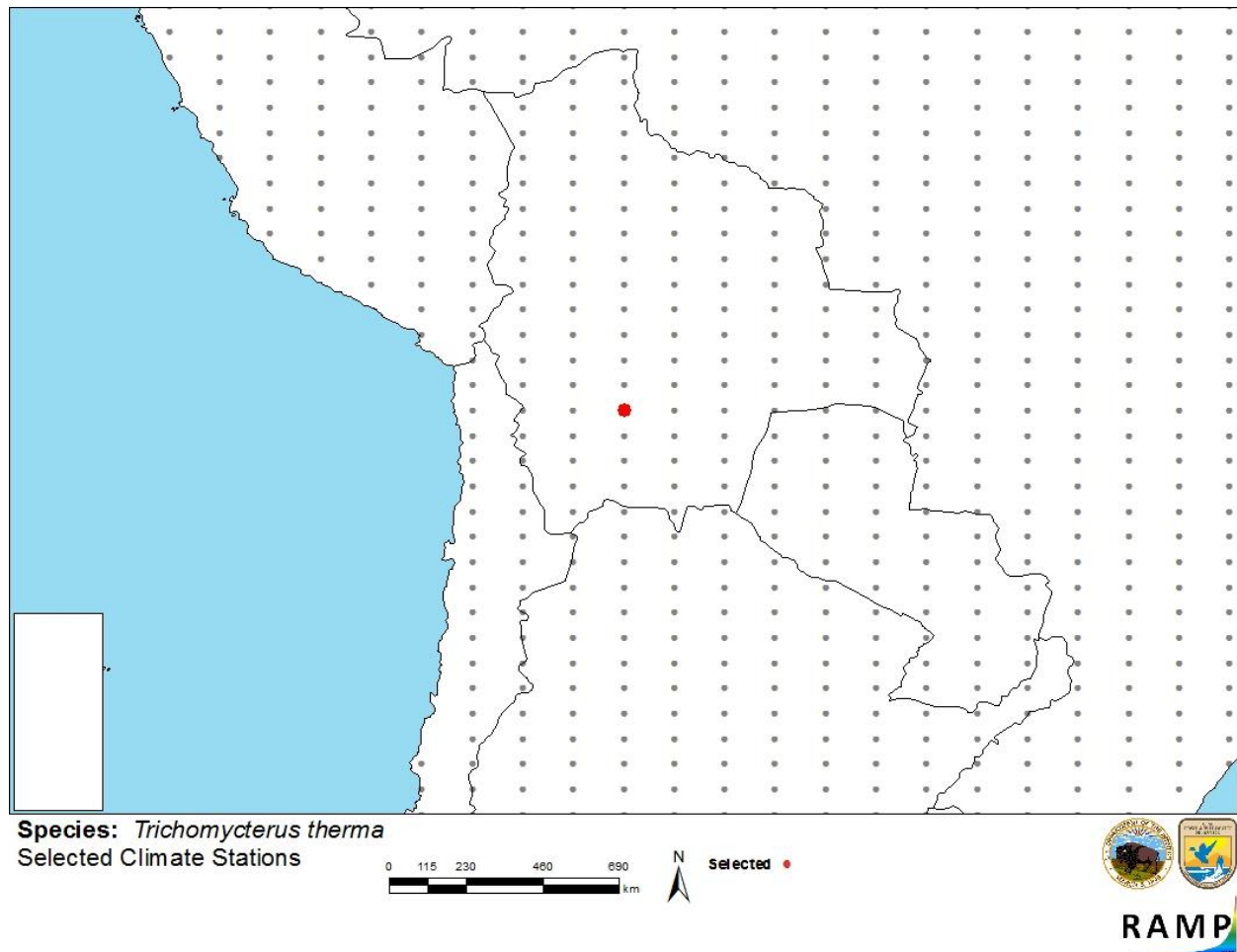


Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations in central South America selected as source locations (red; Bolivia) and non-source locations (gray) for *Trichomycterus therma* climate matching. Source locations from GBIF Secretariat (2016).

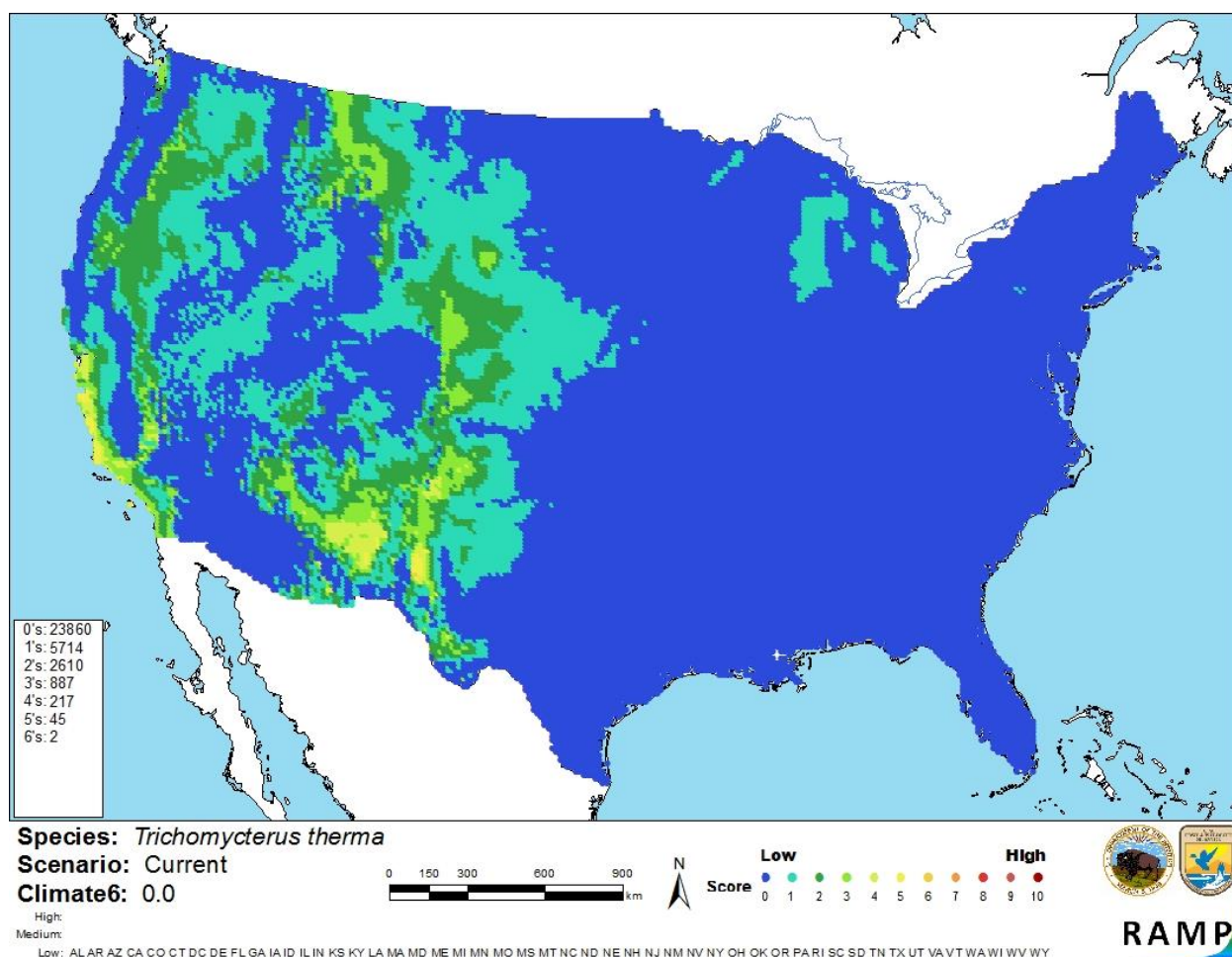


Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *Trichomycterus therma* in the contiguous United States based on source location reported by GBIF (2016). 0= Lowest match, 10=Highest match. Counts of climate match scores are tabulated on the left.

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
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
≥ 0.103	High

7 Certainty of Assessment

Some information on the biology and habitat requirements of this species is available in scientific literature. This species has not been documented outside of its native range. Therefore, data on the impacts of introductions are lacking. The climate matching analysis does not take into account the elevated water temperatures of the thermal stream to which *T. therma* is native, lending uncertainty to the results of the climate matching analysis. Certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Trichomycterus therma is a small catfish known only from its type locality, a man-made thermal bath in Miraflores, Bolivia. This species has never been reported as introduced outside of its native range. History of invasiveness is uncertain. Several U.S. States prohibit or restrict the possession, transport, or trade of this species along with other members of the family Trichomycteridae. *T. therma* has a low overall climate match with the contiguous United States, with medium match in parts of New Mexico and coastal California. Certainty of assessment is low due to lack of information on impacts of introduction, and the inadequacy of the climate matching analysis to account for *T. therma*'s adaptation to high water temperatures. 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

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