

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

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, December 2016

Revised, April 2017

Web Version, 5/4/2018

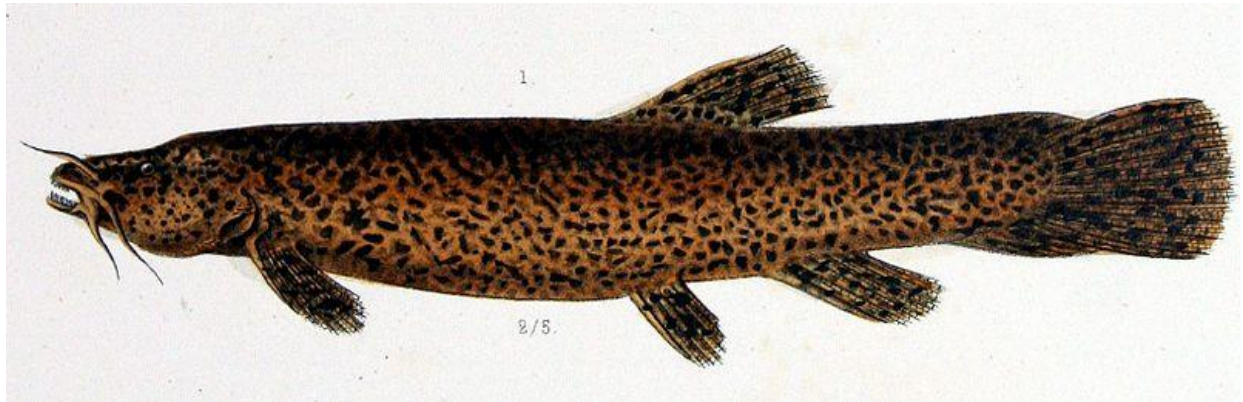


Photo: F. de Laporte de Castelnau; public domain. Available:
<https://commons.wikimedia.org/w/index.php?curid=19664445>. (December 2016, April 2017).

1 Native Range, and Status in the United States

Native Range

From Froese and Pauly (2016):

“South America: High-altitude lakes and streams in the central Andean range (including Lakes Titicaca and Poopó), from Lake Junin in the north to Chilean region of Tarapacá in the south, spanning western Bolivia, Peru and northern Chile.”

Status in the United States

This species has not been reported as introduced or established in the U.S.

From FFWCC (2017):

“Prohibited nonnative species are considered to be dangerous to the ecology and/or the health and welfare of the people of Florida. These species are not allowed to be personally possessed or used for commercial activities. Very limited exceptions may be made by permit from the Executive Director [...] [The list of prohibited nonnative species includes] *Trichomycterus rivulatus*”

Means of Introductions in the United States

This species has not been reported as introduced or established in the U.S.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2016):

“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 rivulatus* Valenciennes in Cuvier and
Valenciennes, 1846”

From Eschmeyer et al. (2016):

“Current status: Valid as *Trichomycterus rivulatus* Valenciennes 1846. Trichomycteridae: Trichomycterinae.”

Size, Weight, and Age Range

From Froese and Pauly (2016):

“Max length : 37.4 cm TL male/unsexed; [de Pínna and Wosiacki 2003]”

Environment

From Froese and Pauly (2016):

“Freshwater; benthopelagic.”

Climate/Range

From Froese and Pauly (2016):

“High altitude, preferred ?”

Distribution Outside the United States

Native

From Froese and Pauly (2016):

“South America: High-altitude lakes and streams in the central Andean range (including Lakes Titicaca and Poopó), from Lake Junin in the north to Chilean region of Tarapacá in the south, spanning western Bolivia, Peru and northern Chile.”

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 Cope (1877):

“Head 5 times in total ; D. 7 ; A. 5 ; closely marbled with dark brown above and below”

Biology

From Vila et al. (2007):

“*Trichomycterus rivulatus* have been observed to move at maturity from deep waters to approach shallower areas of approximately two meters where they dig holes, similar to those made by salmonids. Groups of three to four females spawn their eggs which are fertilized by one or two males. In tanks larvae of *T. rivulatus* and *T. dispar* hatch after six to seven days at 12.5 to 14°C. Spawning is free, psammophilic and partial with a total of 2 500 to 3 500 eggs per female. Eggs have an average diameter of 1.8 mm. Altiplanic Trichomycteridae are benthic feeders eating mainly aquatic insects and amphipods. [...] *T. rivulatus* are considered “rare” (Campos et al., 1998).”

Human Uses

From Vila et al. (2007):

“The culture of the catfishes *T. rivulatus* “Suche” and *T. dispar* “Mauri” have been also practiced at Chucuito and Pomata Centers, Perú. Breeding adults were captured at Lake Titicaca, and were maintained in tanks and net cages, where they were fed with *Hyalella* and earthworms. [...] *T. rivulatus* culture shows an exceptional success with less than 10% of mortality, representing an important new resource for aquaculture in Altiplano ecosystems.”

Diseases

No information available. No OIE-reportable diseases 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 Florida Fish and Wildlife Conservation Commission has listed the parasitic catfish *Trichomycterus rivulatus* as a prohibited species (FFWCC 2017).

4 Global Distribution

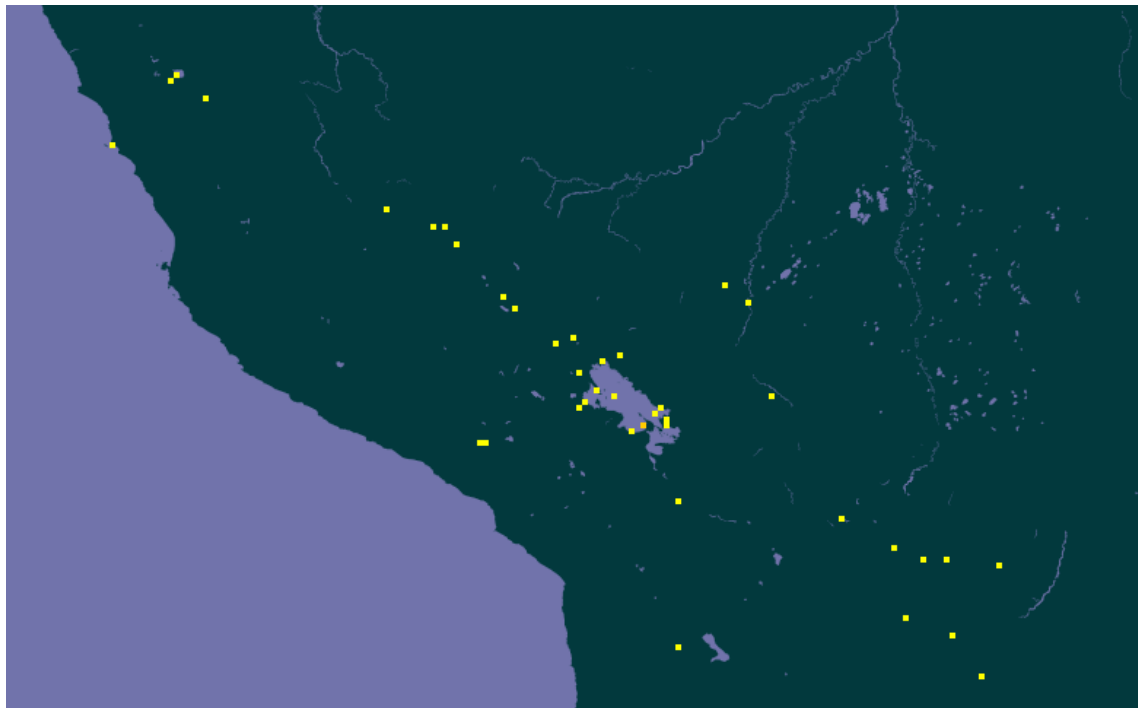


Figure 1. Known global established locations of *Trichomycterus rivulatus* in western Bolivia, Peru, and northern Chile. Map from GBIF (2016). The location from coastal Peru was not included in the climate matching analysis because this species lives at high altitudes.

5 Distribution Within the United States

This species has not been reported as introduced or established in the U.S.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean Distance) was high in southern Florida, medium along the Gulf Coast and the coast of California, and low across the rest of the U.S. Climate 6 proportion indicated that the contiguous U.S. has a medium climate match overall. Proportions in the range greater than 0.005 and less than 0.103 indicate a medium climate match; the Climate 6 proportion of *Trichomycterus rivulatus* was 0.009.

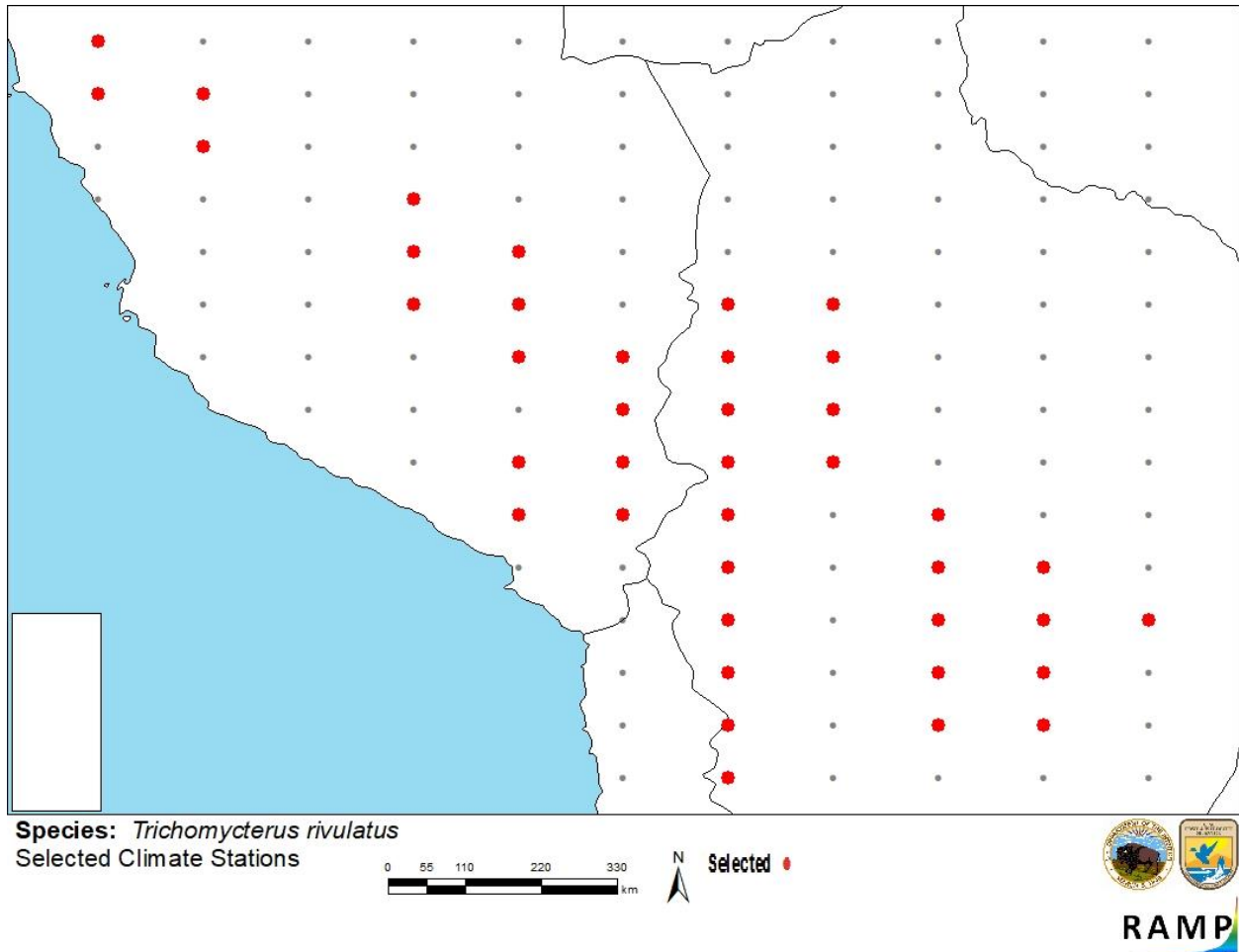


Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations in western South America selected as source locations (red; Peru and Bolivia) and non-source locations (gray) for *Trichomycterus rivulatus* climate matching. Source locations from GBIF (2016).

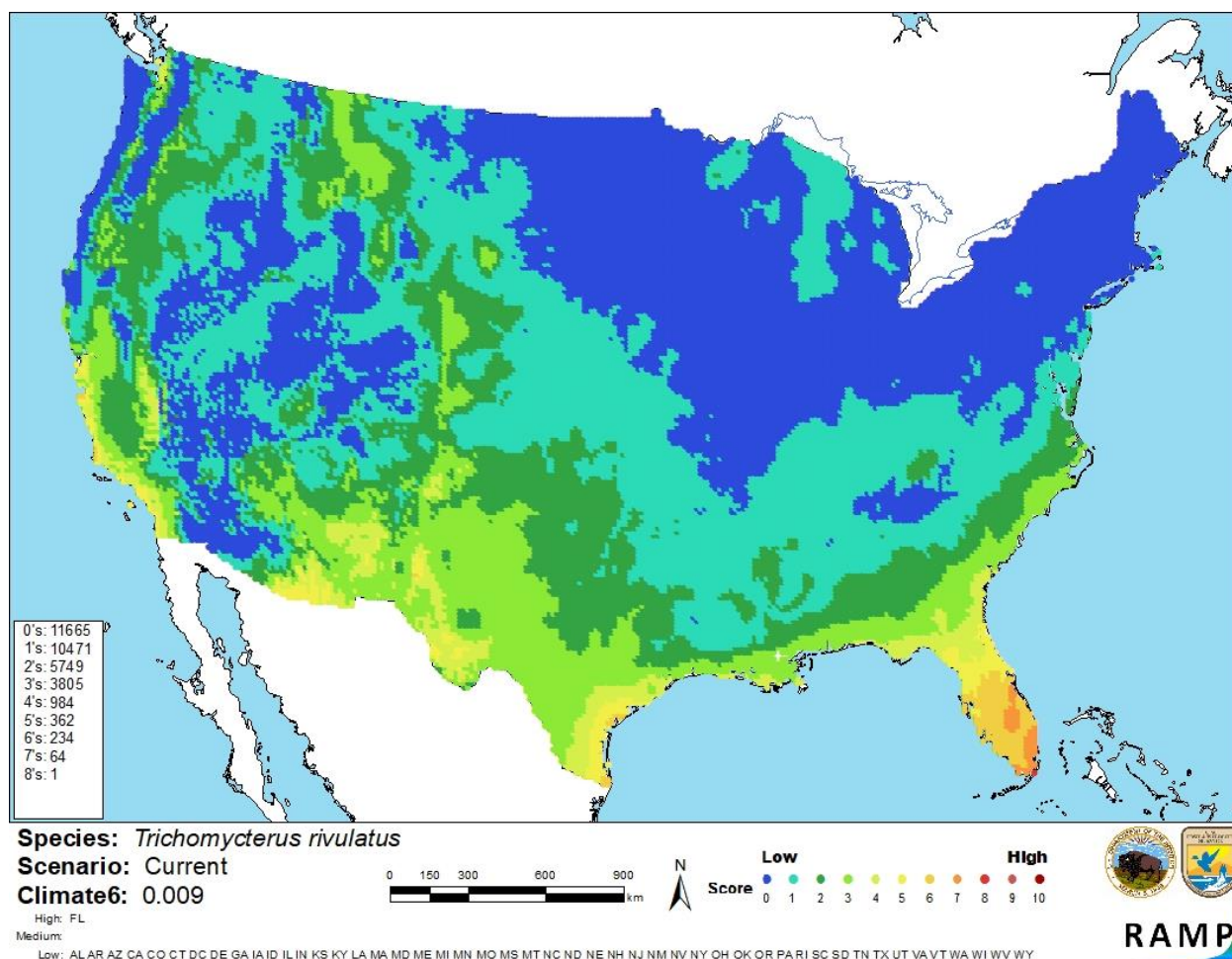


Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *Trichomycterus rivulatus* in the contiguous United States based on source locations reported by GBIF (2016). 0=Lowest match, 10=Highest match. Counts of climate match scores are tabulated on the left.

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

There is some limited information available on the biology of *T. rivulatus*. There is no documented history of introduction for this species, so no negative impacts from introductions and spread of this species have been documented in scientific literature. Certainty of this assessment is low because of the lack of information.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Trichomycterus rivulatus is a catfish native to high elevation waters in the Andean range. It has a medium climate match with the contiguous U.S., with the area of highest climate match located in southern Florida. There is some information available on the biology of this species, but it has no documented history of introduction. The Florida Fish and Wildlife Conservation Commission has listed the parasitic catfish *T. rivulatus* as a prohibited species. Overall risk assessment category is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): Uncertain**
- **Climate Match (Sec. 6): Medium**
- **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.

Cope, E. D. 1877. Synopsis of the cold blooded Vertebrata, procured by Prof. James Orton during his exploration of Peru in 1876-77. Proceedings of the American Philosophical Society 17(100):33-49.

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>. (December 2016).

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GBIF (Global Biodiversity Information Facility). 2016. GBIF backbone taxonomy: *Trichomycterus rivulatus* Valenciennes, 1846. Global Biodiversity Information Facility, Copenhagen. Available: <http://www.gbif.org/species/2343081>. (December 2016, April 2017).

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Virginia. Available:

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Sanders, S., C. Castiglione, and M. Hoff. 2014. Risk Assessment Mapping Program: RAMP. U.S. Fish and Wildlife Service.

Vila, I., R. Pardo, and S. Scott. 2007. Freshwater fishes of the Altiplano. *Aquatic Ecosystem Health & Management* 10(2):201-211.

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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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.