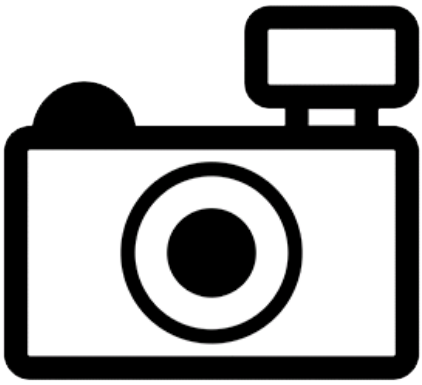
Hypostomus macushi (a catfish, no common name)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, January 2013
Revised, September 2018
Web Version, 2/25/2019



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1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2018a):

"South America: Rupununi River, Essequibo River and Takutu and Ireng Rivers (Negro River drainage) along the Guyana-Brazil border."

Status in the United States

This species has not been reported as introduced or established in the United States. However, unidentified members of the genus are established in the United States.

From Nico et al. (2018):

"Several morphologically distinct but unidentified *Hypostomus* species have been recorded as established in the United States: these included populations in Indian Springs in Nevada; Hillsborough County in Florida; and the San Antonio River and San Felipe Creek in Texas (Courtenay and Deacon 1982; Courtenay et al. 1984, 1986; Courtenay and Stauffer 1990; Page and Burr 1991; López-Fernández and Winemiller 2005). A population of an unidentified *Hypostomus* species is firmly established in Hawaii (Devick 1991a, b). Reported from Arizona,

Colorado, Connecticut, Louisiana, and Pennsylvania. Failed in Connecticut, Massachusetts, and Pennsylvania."

This species was not found for sale from U.S.-based online aquarium retailers and it does not appear to be in trade in the United States.

Means of Introduction into the United States

This species has not been reported as introduced or established in the United States. However, unidentified members of the genus are established in the United States.

From Nico et al. (2018):

"Members of this genus have been introduced through a combination of fish farm escapes or releases, and aquarium releases (Courtenay and Stauffer 1990; Courtenay and Williams 1992). In Texas, the initial introduction occurred when *Hypostomus* entered local streams after escaping from pool and canal systems of the San Antonio Zoological Gardens in or before 1962 (Barron 1964); the Comal County introduction was probably due to an aquarium release (Whiteside and Berkhouse 1992)."

Remarks

From Nico et al. (2018):

"The genus *Hypostomus* contains about 116 species (Burgess 1989). Highlighting the serious need for additional taxonomic and systematic work, Armbruster (1997) concluded that it is currently impossible to identify most species in the genus. Several apparently different *Hypostomus* species have been collected in the United States but not definitively identified to species level (Page and Burr 1991; Courtenay and Stauffer 1990). Distinguishing characteristics of the genus and a key to loricariid genera were provided by Burgess (1989) and Armbruster (1997). Photographs appeared in Burgess (1989) and Ferraris (1991). *Hypostomus* has officially replaced the generic name *Plecostomus*. The genus was included in the key to Texas fishes of Hubbs et al. (1991) and several identifying traits were also given by Page and Burr (1991)."

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From Froese and Pauly (2018b):

"Biota > Animalia (Kingdom) > Chordata (Phylum) > Vertebrata (Subphylum) > Gnathostomata (Superclass) > Pisces (Superclass) > Actinopterygii (Class) > Siluriformes (Order) > Loricariidae (Family) > Hypostominae (Subfamily) > *Hypostomus* (Genus) > *Hypostomus macushi (Species)*"

From Fricke et al. (2019):

"Current status: Valid as *Hypostomus macushi* Armbruster & de Souza 2005. Loricariidae: Hypostominae."

Size, Weight, and Age Range
From Froese and Pauly (2018a):

"Max length : 17.0 cm SL male/unsexed; [Zawadzki and Carvalho 2014]"

Environment
From Froese and Pauly (2018a):

"Freshwater; demersal."

Climate/Range
From Froese and Pauly (2018a):

"Tropical"

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

"South America: Rupununi River, Essequibo River and Takutu and Ireng Rivers (Negro River drainage) along the Guyana-Brazil border."

Introduced
No introductions of this species have been reported.

Means of Introduction Outside the United States
No introductions of this species have been reported.

Short Description
From Armbruster and de Souza (2005):

"Hypostomus macushi can be separated from all other *Hypostomus* except the species of the *H. cochliodon* group based on the presence of large, spoon-shaped teeth (vs. viliform teeth and loss of the buccal papilla; and from all members of the *H. cochliodon* group except *H. cochliodon, H. ericae*, *H. ericius* and *H. paucipunctatus* by the presence of very widely spaced black spots on a light background. *Hypostomus macushi* can be separated from *H. cochliodon* by lacking a longitudinal ridge on the pterotic-supracleithrum and a lack of longitudinal dark stripes; from *H. ericius* by lacking keels formed from sharp odontodes on the lateral plates; from *H. ericae* and *H. paucipunctatus* by lacking a buccal papilla; from *H. ericae* by having spots in the distal dorsal and caudal fins not combining (vs. spots combining to form wavy lines); and from *H. paucipunctatus* by having medium to large spots (vs. very small spots). *Hypostomus macushi* can additionally be separated from *H. cochliodon, H. ericius, H. oculeus, H. pyrineusi*, and *H. sculpodon* by having seven to eight adipose-caudal plates (vs. nine to 16); and from *H. hemicochliodon, H. hondae, H. pagei, H. plecostomoides, H. sculpodon, H. simios*

and H. soniae by generally having no odontodes on the opercle (zero to 10), vs. having a patch of greater than 10 odontodes on the opercle."

"Color light gray to tan when alive, becoming tan when preserved. Body covered with small- to medium-sized spots widely separated from one another, head spots just slightly smaller than body spots. Spots on all fins except anal fin generally larger than spots on body, centered on rays and spines; anal fin with one to two bands or mottled. Caudal fin generally with clear area at base and spots almost fading into a dark wash distally. Abdomen slightly lighter than sides, with fewer spots (spots absent on abdomen in juveniles. Spots relatively larger in juveniles. Juveniles with bands in the dorsal and paired fins, and caudal with a distal clear band that does not extend completely into the lower lobe, preceded by a dark band that extends to the tip of the lower lobe, preceded by a clear area. Juveniles with a dark bar at end of caudal peduncle"

Biology

From Armbruster and de Souza (2005):

"The *Hypostomus cochliodon* group [which includes *H. macushi*] is one of two groups of loricariids whose members are known to consume wood as the major part of the diet (Schaefer and Stewart 1993; Nelson et al. 1999; Armbruster 2003)."

"Found among submerged, dead wood in modest to swift flow. The Macushi people collected the holotype and several of the paratypes collected with it by spearing them in fairly deep (2m) water in the Ireng River."

Human Uses

No information available.

Diseases

No information available. No OIE-reportable diseases have been documented in this species.

Threat to Humans

From Froese and Pauly (2018a):

"Harmless"

3 Impacts of Introductions

No introductions of *H. macushi* have been reported outside its native range so no impacts of introduction are known. However, unidentified members of the genus are established in the United States.

From Nico et al. (2018):

"The effects of these loricariid catfish is largely unknown. In Texas, Hubbs et al. (1978) reported possible local displacement of algae-feeding native fishes such as *Campostoma anomalum* by

Hypostomus, and López-Fernández and Winemiller (2005) suggest that reductions in *Dionda diaboli* abundance in portions of San Felipe Creek are due to population increases of *Hypostomus*. Because of their abundance in Hawaii, introduced *Hypostomus, Pterygoplichthys,* and *Ancistrus* may compete for food and space with native stream species (Devick 1989; Sabaj and Englund 1999)."

4 Global Distribution

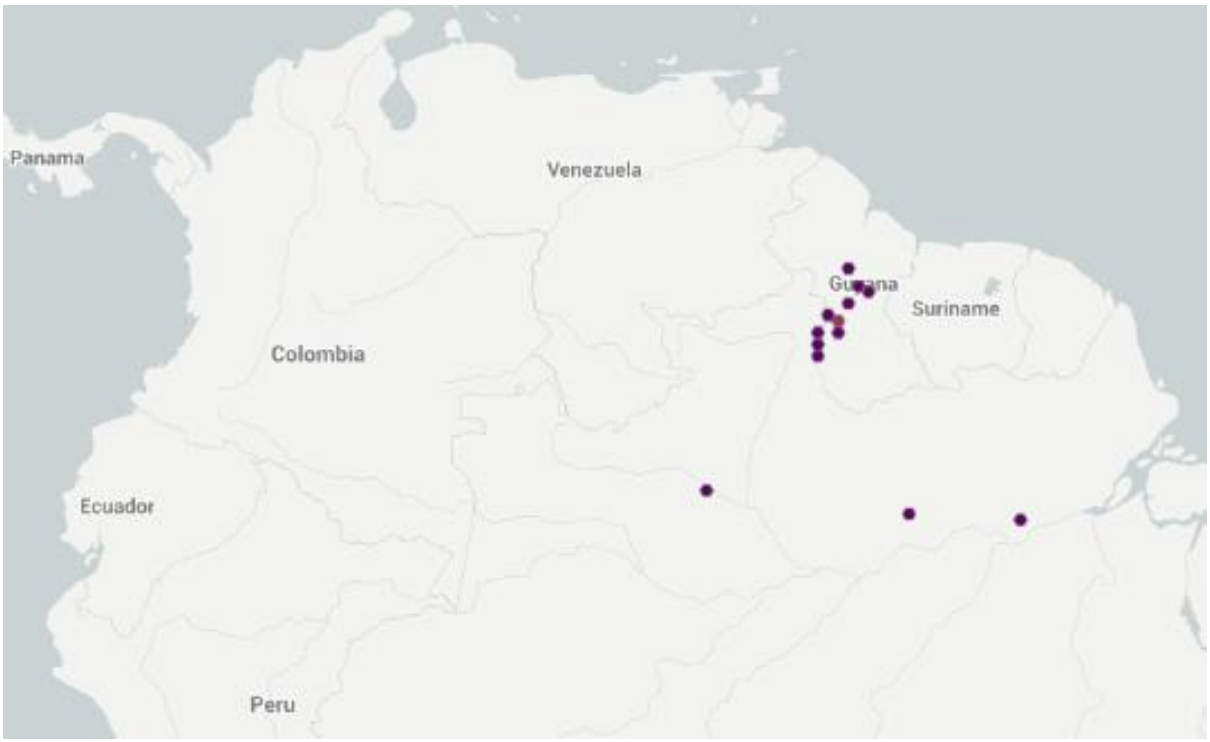

Figure 1. Known global distribution of *H. macushi*, reported from the Guyana-Brazil border. Map from GBIF Secretariat (2017). The three southernmost occurrences were not included in the climate matching analysis because they are outside the known established range of the species.

5 Distribution within the United States

There is currently no known distribution of *Hypostomus macushi* within the United States; however, unidentified species of *Hypostomus* are established in Nevada, Florida, Texas, and Hawaii.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2018; 16 climate variables; Euclidean Distance) was medium in extreme southern Texas and otherwise low throughout the contiguous United States. The Climate 6 score indicated that the contiguous United States has a low climate match overall. Scores of 0.005 and below indicate low match; Climate 6 score of *H. macushi* was 0.000. All states had a low climate score.

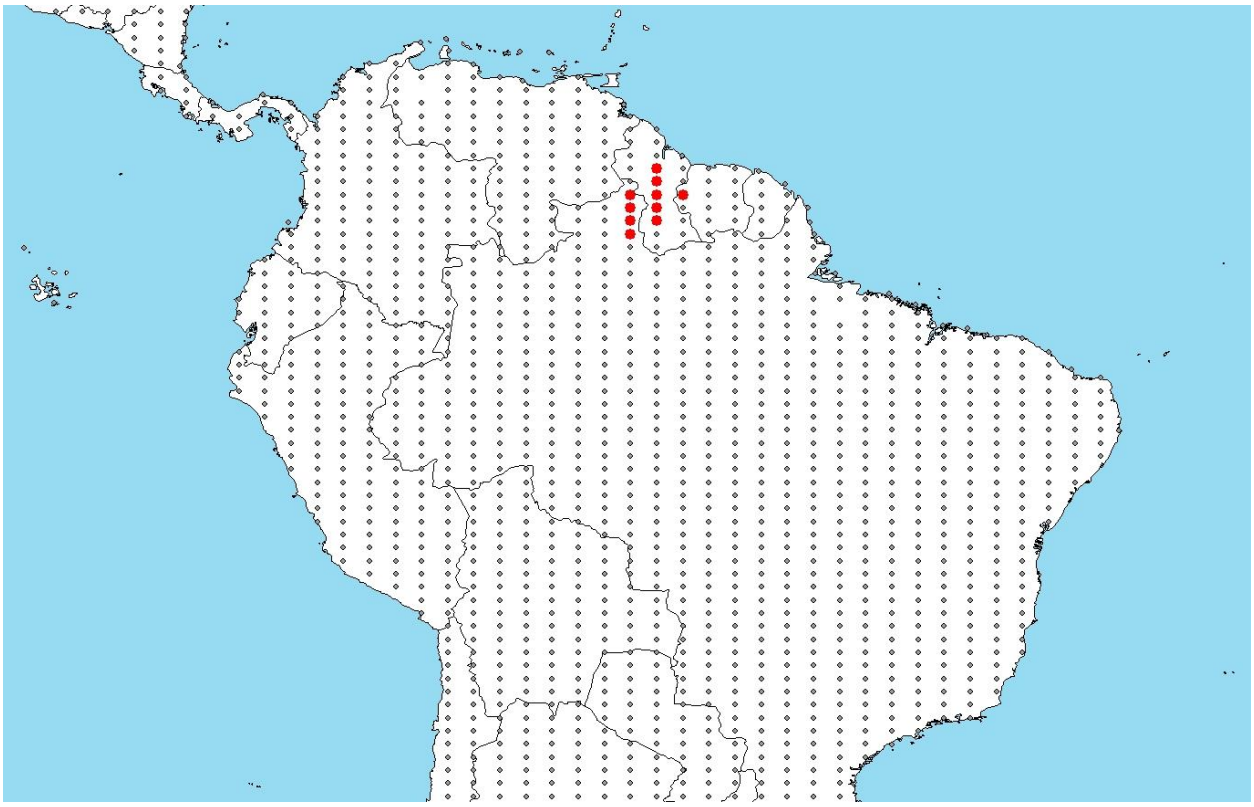

Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations selected as source locations (red; Guyana, Brazil, Suriname) and non-source locations (gray) for *H. macushi* climate matching. Source locations from GBIF Secretariat (2017). Selected weather stations are located within 100 km of a species occurrence, and do not necessarily represent an occurrence location itself.

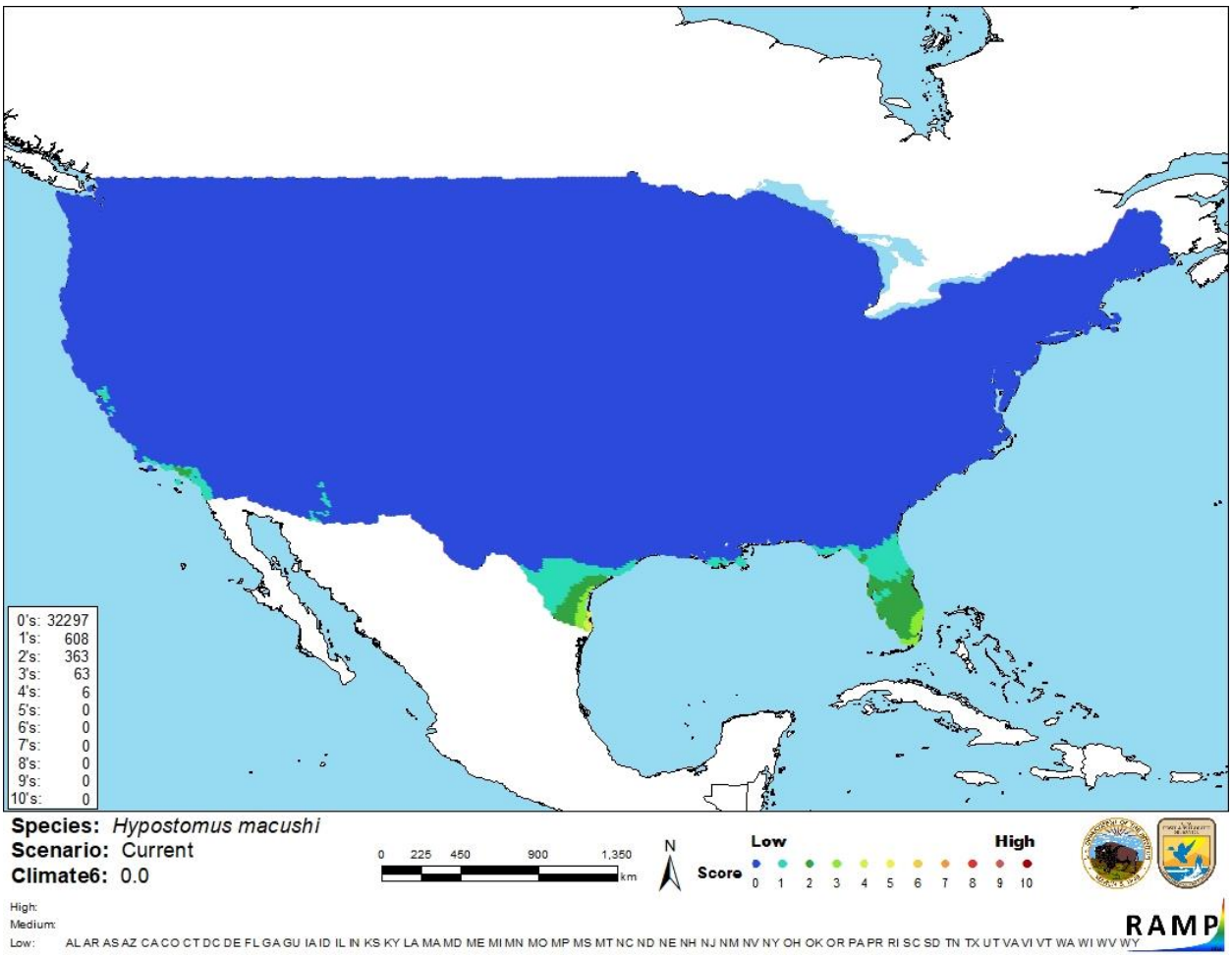

Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *H. macushi* in the contiguous United States based on source locations reported by GBIF Secretariat (2017). 0= Lowest match, 10= Highest match.

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

7 Certainty of Assessment

Limited information was available on the biology and ecology of *H. macushi*. It has not been reported as introduced outside its native range, so no impacts of introduction are known. However, unidentified species of *Hypostomus* have become established in the United States, and it is possible that one or more of those populations could be identified later as *H. macushi*. There is considerable uncertainty about the taxonomy of this genus and about species-level identification. Certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Hypostomus macushi is a catfish native to several rivers in Guyana and adjacent areas of Brazil. This species has no documented history of introduction in the United States or elsewhere outside its native range. However, unidentified species of *Hypostomus* are established in the United States. History of invasiveness is uncertain. *H. macushi* does not appear to be present in trade in the United States or elsewhere. The climate match was low throughout the contiguous United States. Because of the lack of documented introduction history and substantial taxonomic uncertainty, certainty of this assessment is low and overall risk 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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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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