Hypostomus cochliodon (a catfish, no common name)
Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, January 2013
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1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2017):

“South America: Paraguay and middle Paraná River basins.”

From Armbruster (2003):

“The upper 2/3 of the Río Paraguay basin of Brazil and Paraguay […]”

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

Means of Introductions in the United States
This species has not been reported as introduced or established in the U.S.

Remarks
From Nico et al. (2017):

"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)."

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 Actinopterygii
Class Teleostei
Superorder Ostariophysi
Order Siluriformes
Family Loricariidae
Subfamily Hypostominae
Genus *Hypostomus*
Species *Hypostomus cochliodon* Kner, 1854"

"Current Standing: valid"

Size, Weight, and Age Range
From Froese and Pauly (2017):

"Max length: 23.0 cm SL male/unsexed; [Weber 2003]"

Environment
From Froese and Pauly (2017):

"Freshwater; benthopelagic; pH range: 6.3 - 7.2; dH range: 10 - 18."

From Valério et al. (2007):

"*Astyanacinus moorii*, *Hypostomus cochliodon* and *Hypostomus* sp. were associated mainly with low altitudes and high water velocity, higher conductivity, deep and larger streams […]"

Climate/Range
From Froese and Pauly (2017):

"Tropical; 21°C - 24°C [Baensch and Riehl 1985]"

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

"South America: Paraguay and middle Paraná River basins."

From Armbruster (2003):

"The upper 2/3 of the Río Paraguay basin of Brazil and Paraguay […]"

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 (2003):

"*Hypostomus cochliodon* can be distinguished from all other members of the *H. cochliodon* group by its almost entirely brown coloration with ventral half of dorsal plate row and dorsal half of supramedian plate row slightly lighter than lower rows forming a tan stripe, and spots, when present, small and widely placed (vs. spots usually well-developed and closely placed). Unlike most other members of the *H. cochliodon* group, *H. cochliodon* can also be entirely dark brown with no spots anywhere on the body (other members of the *H. cochliodon* group may be very dark, but will retain spots on fins or the abdomen)."

From Tencatt et al. (2014):

“Specimens that have the color pattern (with a dark brown stripe) which Armbruster (2003) described in his redescription of *H. cochliodon* can be clearly distinguished from those specimens showing the pattern described by Kner for *H. cochliodon* by the differences in the number and morphology of jaw teeth as well as the extent of development of keels along laterals of body and morphology of the opercle. Specimens with the dark brown stripe are named herein as *H. khimaera* and have been found in the type locality of *H. cochliodon*, and other nearby sites of the rio Paraguay basin. Therefore, Armbruster's redescription of *H. cochliodon*, appears to be a combination of these two species and that the "true" *H. cochliodon* has only a minimum of morphological and color variation through its whole geographical distribution.”

“*Hypostomus cochliodon* is distinguished from all other species of *Hypostomus*, except those belonging to the *H. cochliodon* group, by having the following unique combination of features: notch between metapterygoid and hyomandibula absent (vs. notch present) and strongly angled dentaries, less than 80º (vs. shallow angle between dentaries, generally more than 80º).”

Biology

From Armbruster (2003):

“Loricariids are typically algivorous or detritivorous, but the *Hypostomus cochliodon* group (formerly the genus *Cochliodon* Kner) and *Panaque* Eigenmann are unique among fishes in that they consume wood (Schaefer & Stewart 1993; Nelson et al. 1999). The *H. cochliodon* group and *Panaque* share the derived presence of large, spoon-shaped teeth; however, they are unrelated and are placed in two different tribes, the Hypostomini and the Ancistrini, respectively (Armbruster 1997; [2004]).”

From Terán et al. (2016):

“Most streams in the upper Bermejo River basin, in the lower portion of the Yungas, where *H. cochliodon* was collected, have abundant marginal vegetation and rocky bottoms. When the Bermejo River reaches the chaco-pampean plain, near the city of Embarcación in Salta, a sudden ecological change is observed; the bottom is muddy, driftwood is abundant and the water is turbid, with a great amount of solids in suspension the whole year, although in the dry season water is less turbid (Alonso and Terán pers. obs.). […] Nevertheless, many species are shared between the upper Bermejo River basin and the remaining Paraná–Paraguay basins such as the case of *H. cochliodon* […]”

Human Uses

From Froese and Pauly (2017):

“Aquarium: commercial”

From Nico et al. (2017):

“Members of this genus are popular aquarium fishes.”

Diseases

From Froese and Pauly (2017):

"*Raphidascaris* Infection 2, Parasitic infestations (protozoa, worms, etc.) […]
Procamallanus Infection 16, Parasitic infestations (protozoa, worms, etc.)"

From Lopes et al. (2011):

"*Gorytocephalus elongorchis* Thatcher, 1979 was found in the new hosts *Hypostomus cochliodon* Kner, 1854, *H. regani* Ihering, 1905 and *Loricaria* sp. […]"

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

Threat to Humans

From Froese and Pauly (2017):

"Harmless"

3 Impacts of Introductions

The following information discusses the impacts of loricariid, or suckermouth, catfishes in general. *Hypostomus cochliodon* is assumed to have similar traits and behave similarly to other members of its family, but there is no information available to confirm this assumption.

From Nico et al. (2017):

"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)."

From Hoover et al. (2014):

"Suckermouth catfishes burrow into banks and bottom sediments to create chambers in which females lay eggs and males guard the developing mass of eggs (Burgess 1989; Ferraris 1991). Burrows may be especially evident in highly disturbed urban ponds (ERDC) and streams (Tompkins 2004). When burrows are dense, erosion, sedimentation, and elevated turbidity may result (Devick 1988, 1989, 1991[b]). Bank failure, shoreline collapse, and a characteristic terracing have been observed in Mexico, Texas, and Florida where burrow densities were high […] Not all infested waters, however, exhibit significant erosion."

"[…] sheer numbers of these large, grazing animals can create problems for other animals (e.g., competition for food or space with like-sized aquatic organisms, or interference with other animals. Competition has apparently taken place in Hawaiian streams where native species no longer exist in the presence of high densities of suckermouth catfishes (Englund et al. 2000) or are threatened by low water quality after fishkills (Honolulu Advertiser 2006)."

"Suckermouth catfishes produce copious and conspicuous feces (Sandford and Crow 1991, Ferraris 1991 […]) which, in aquatic systems, transforms and translocates nutrients, alters sediment characteristics, and impacts microbial and benthic communities (Wotton and Malmqvist 2001), notably so in subtropical environments (e.g., Iovino and Bradley 1969, Frouz et al. 2004)."

"Economic impacts of suckermouth catfishes have been quantified for commercial tilapia fishing in Florida and for Mexico (Mendoza-Alfaro et al. 2009). In Florida, during the period 1993-2006, tilapia catch in six lakes decreased from 45- 80% to 17-30% after suckermouth catfishes became established, after which they represented 11-65% of the commercial catch."

"Social impacts resulting from economic impacts have been most pronounced in Mexico, where thousands of livelihoods in the Balsas Basin have been affected by the collapse of commercial fisheries. The collapse has impacted health status (e.g., wounds, infections, vaccinations), unemployment, emigration, and has created changes in household structure (Mendoza-Alfaro et al. 2009)."

4 Global Distribution

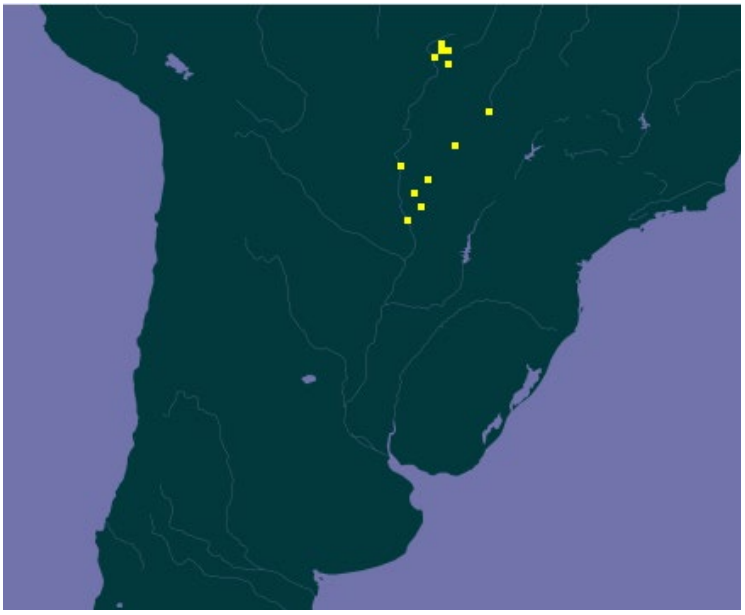

Figure 1. Known global distribution of *H. cochliodon*. Map from GBIF (2016). Points outside the Paraguay and Paraná River basins (Brazil and Paraguay) were excluded from this map and from the climate matching analysis because the species is not known to be established outside these basins (see Distribution Outside the United States, above).

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 peninsular Florida and near Houston, Texas. The remainder of the Southeast showed a medium climate match, but the majority of the United States showed a low climate match. Climate 6 score indicated that the contiguous U.S. has a medium climate match overall. The range of scores indicating a medium climate match is 0.005-0.103; Climate 6 score for *H. cochliodon* was 0.059.

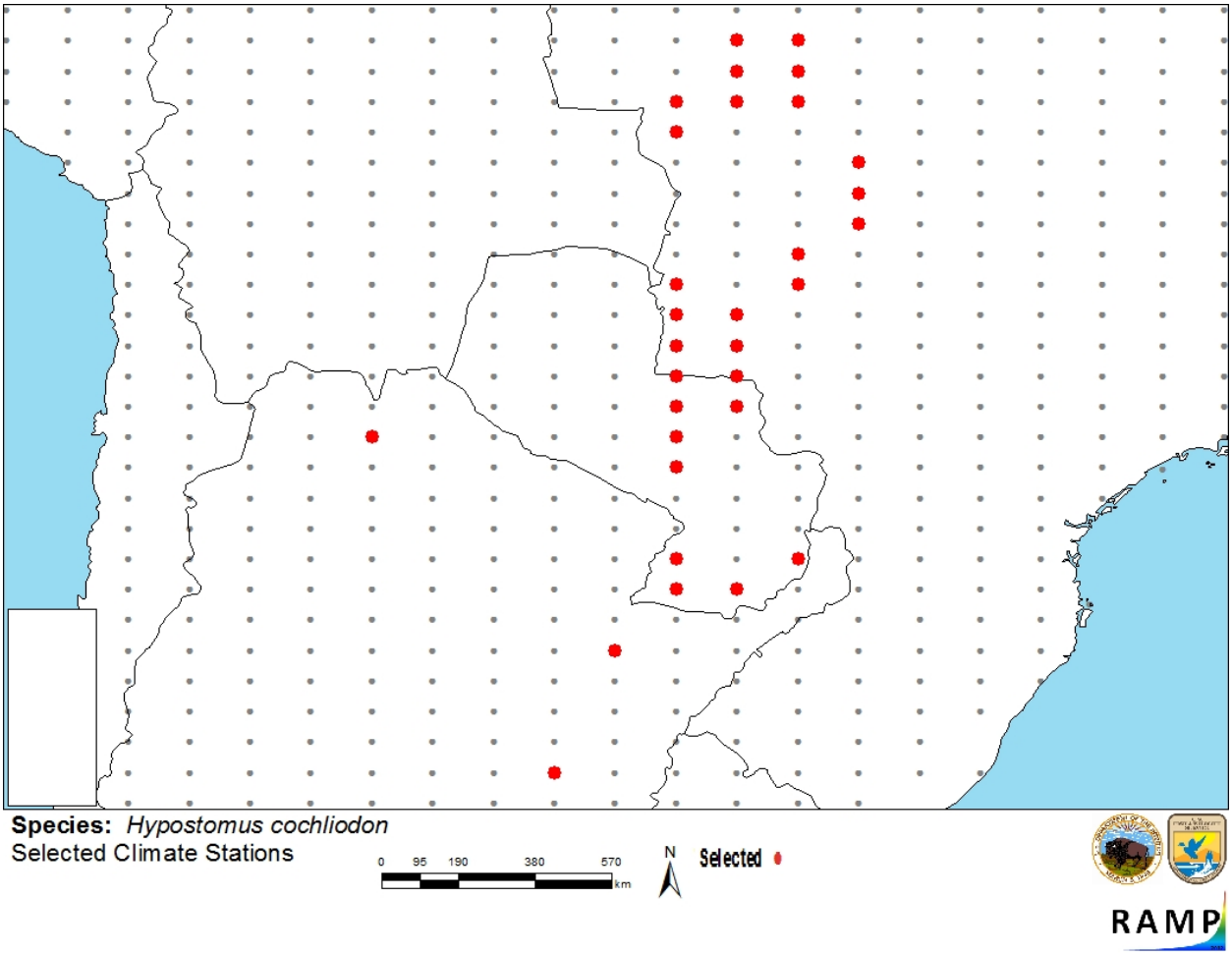

Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations in central South America (Brazil, Paraguay, and Argentina) selected as source locations (red) and non-source locations (gray) for *H. cochliodon* climate matching. Source locations from GBIF (2016) and Terán et al. (2016).

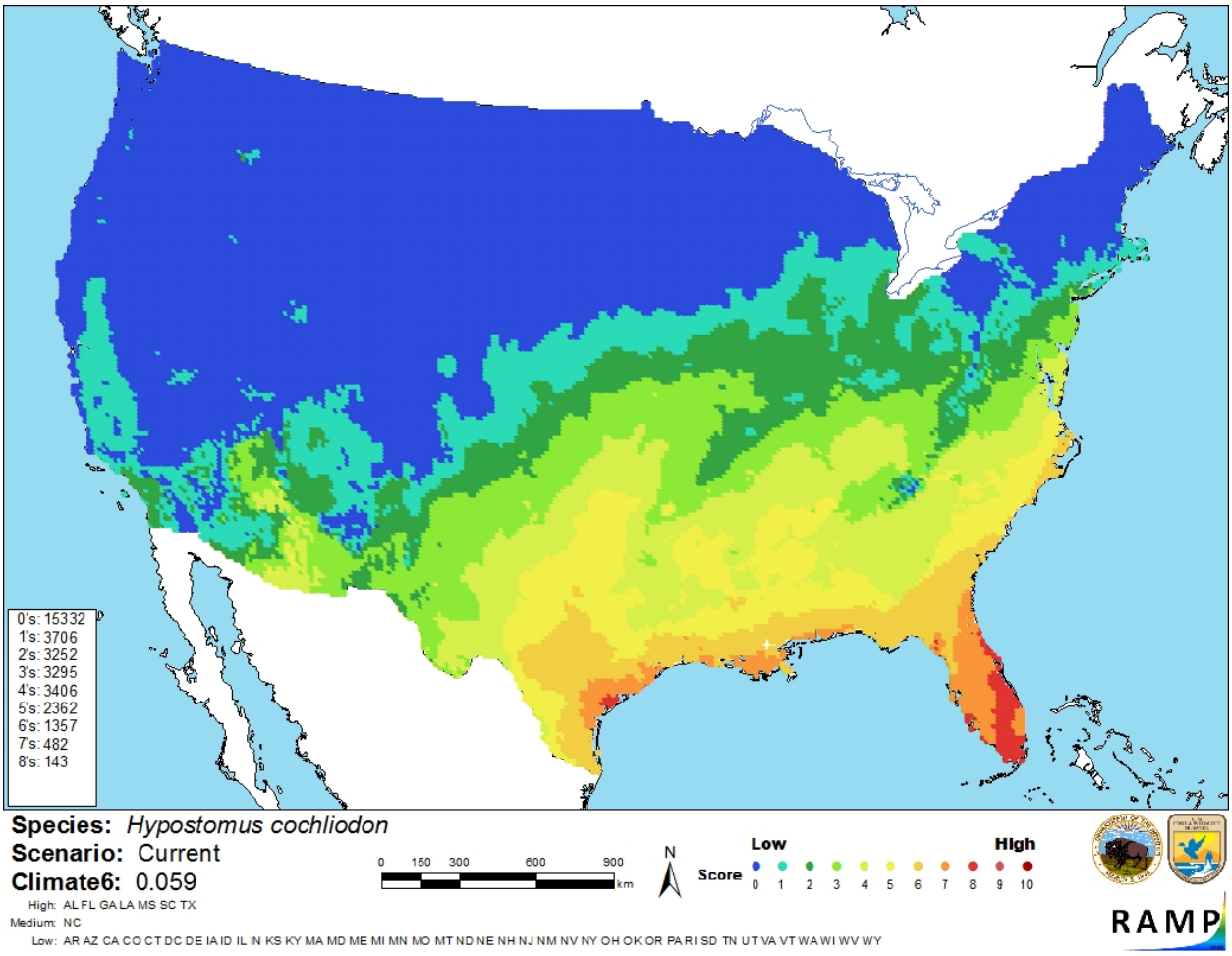

Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *H. cochliodon* in the contiguous United States based on source locations reported by GBIF (2016) and Terán et al. (2016). 0=Lowest match, 10=Highest match.

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 *H. cochliodon*, likely in part because identification of members of the *H. cochliodon* group to the species level is difficult. *Hypostomus* spp. fishes have been introduced and become established in the United States, but they have not been identified to the species level. All information on potential impacts of introduction are described at the genus

level. Because of this taxonomic uncertainty and the cryptogenic character of individuals established in the U.S., certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Hypostomus cochliodon is a member of the suckermouth armored catfish family (*Loricariidae*), native to South America. This species has not been reported outside of its native range in the Paraguay and middle Paraná River basins; there are no reported occurrences in the United States. However, members of the *Hypostomus* genus have been collected in the U.S., and these populations have not been identified down to the species level. It is important to note the difficulty in identifying the species of the *Hypostomus* genus. Competition with native species, changes to the physical and chemical attributes of the environment, and disruption of fisheries were cited as potential impacts of *Hypostomus* spp. introduction. *H. cochliodon* had a medium Climate 6 score with the contiguous U.S.; the Southeast, particularly Florida, was found to be the most compatible region for this species in terms of climate. The overall risk assessment category is uncertain for *H. cochliodon* due to the many uncertainties surrounding this species and its introduction history.

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.

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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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