

Candiru (*Vandellia cirrhosa*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, January 2017
Revised, February 2017
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<https://commons.wikimedia.org/w/index.php?curid=30898051>. (February 2017).

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2016):

“South America: Amazon River basin [Bolivia, Brazil, Colombia, Ecuador, Peru].”

From Newtoff (2013):

“Candiru are found exclusively in the upper Amazon River and Orinoco River [Venezuela, Colombia] basins in northern South America. ([Encyclopedia of Life] 2012; Berra, 2007; Cheng, 1986; Spotte, 2002; Uhlenbroek, 2011)”

Status in the United States

This species has not been reported as introduced in the United States. There is no indication that this species is in trade in the United States.

From FFWCC (2016):

“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] *Vandellia cirrhosa*”

Means of Introductions into the United States

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

Remarks

From GBIF (2016):

“SYNONYMS

Plectrochilus erythrurus (Eigenmann, 1922)

Urinophilus erythrurus Eigenmann, 1922

Vandellia balzanii Perugia, 1897

Vandellia gigantea Cornalia, 1849

Vandellia plazae Günther, 1864

Vandellia plazaii Castelnau, 1855”

In addition to the accepted scientific name, searches were conducted with each synonym for evidence of introduction or impacts.

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 Bleeker, 1858
Subfamily	Vandelliinae
Genus	<i>Vandellia</i>
Species	<i>Vandellia cirrhosa</i> Valenciennes in Cuvier and Valenciennes, 1846”

“Current Standing: valid”

Size, Weight, and Age Range

From Froese and Pauly (2016):

“Max length : 17.0 cm SL male/unsexed; [de Pinna and Wosiacki 2003]”

Environment

From Froese and Pauly (2016):

“Freshwater; demersal.”

From Newtoff (2013):

“Candiru live in shallow, slow moving, acidic waterways with muddy or sandy bottoms. These demersal fish can be found burrowed in the riverbed most of the time, only emerging to feed or mate. (Froese and Torres, 2012; Piper, 2007; Spotte, 2002; Uhlenbroek, 2011)”

Climate/Range

From Froese and Pauly (2016):

“Tropical, preferred ?”

Distribution Outside the United States

Native

From Froese and Pauly (2016):

“South America: Amazon River basin [Bolivia, Brazil, Colombia, Ecuador, Peru].”

From Newtoff (2013):

“Candiru are found exclusively in the upper Amazon River and Orinoco River [Venezuela, Colombia] basins in northern South America. ([Encyclopedia of Life] 2012; Berra, 2007; Cheng, 1986; Spotte, 2002; Uhlenbroek, 2011)”

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 Günther (1864):

“Body elongate, rounded, its depth being equal to the length of the head, and one-tenth of the total. Head depressed, as broad as long, with the upper jaw produced. Barbel about half as long as the head. Five teeth on the vomer, the middle of which is the longest.”

From Newtoff (2013):

“Candiru are small, thin catfish. They have no scales and their bodies are translucent, becoming colored only after feeding. These fish have barbels near their mouths, which are lined with minute, needle-like teeth. [...] The body is narrow and cylindrical, with a slightly flattened head. Candiru have short, backward facing spines on their gill covers, which help to prevent it from being dislodged while feeding, and large black eyes (relative to body size), which are placed on top of the head. (Breault, 1991; Cheng, 1986; Harvey, 2008; Helfman and Collette, 2011; Piper, 2007; Uhlenbroek, 2011; de Pinna and Wosiacki, 2003)”

Biology

From Froese and Pauly (2016):

“Enters the gill cavity of larger fish to suck blood; burrows in sandy bottoms. [...] When inactive, it remains buried in soft, muddy bottom. Active both during daytime and at night while foraging for blood [Zuanon and Sazima 2004]. Uses visual and chemo-sensory orientation to find potential hosts [Spotte 2002, Zuanon and Sazima 2004]. Forces itself under the gill cover of host fish to enter gill chamber during ventilation of the latter. Bites mostly at the ventral or dorsal aorta arteries, and the blood is pumped into its gut by the host's blood pressure. It does not need any special sucking or pumping mechanism to quickly engorge itself with blood, but simply uses its needle-like teeth to make an incision in an artery. Thus, the notion of the blood-sucking candiru is a misleading concept. Able to engorge itself enormously, the ingested blood is visible through the swollen belly. Some kind of valve or sphincter is likely present to prevent reflux of ingested blood. Time required to engorge itself with blood and leave host's gill chamber ranges from 30 to 145 seconds. Some host fish species (*Colossoma macropomum*) are able to hamper candiru's attacks by pressing it under the membranous gill-cover flap, or by using its pectoral fin to press it against the flank or to sweep it from the gill-cover edge [Zuanon and Sazima 2004].”

Human Uses

From Froese and Pauly (2016):

“Fisheries: of no interest”

Diseases

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

Threat to Humans

From Froese and Pauly (2016):

“Traumatogenic [Wheeler 1977]”

From Gunther (1864):

“These fishes are accused of entering and ascending the urethra of persons while bathing, causing inflammation, and sometimes death. Although this story is repeated by most travellers in the Brazils, none of them have ever seen a case confirmatory of it.”

3 Impacts of Introductions

No introductions of this species have been reported. The Florida Fish and Wildlife Conservation Commission (FFWCC 2016) has listed the parasitic catfish *V. cirrhosa* as a prohibited species.

4 Global Distribution

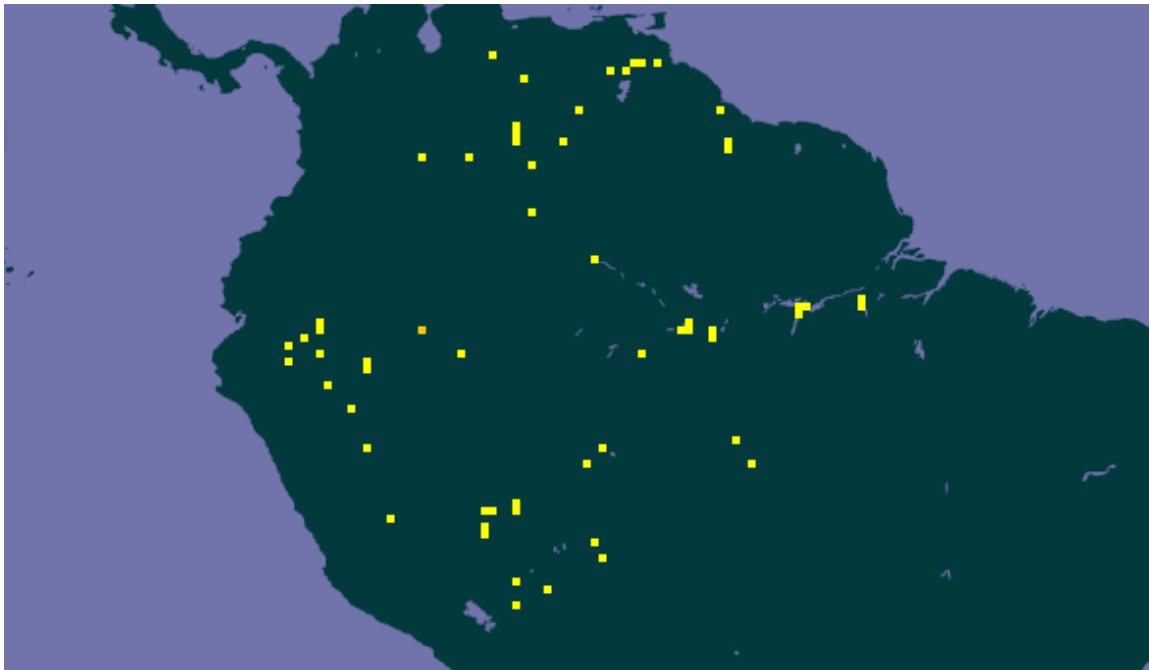


Figure 1. Known global established locations in northern South America of *Vandellia cirrhosa*. Map from GBIF (2016). Points in Guyana were not included in climate matching because they are located outside the known range of *V. cirrhosa* (Amazon and Orinoco River basins; see Distribution Outside the United States).

5 Distribution Within the United States

This species has not been reported in the United States.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean Distance) was medium to high in southern Florida, medium along the Gulf Coast, and low throughout the rest of the contiguous United States. The Climate 6 proportion indicated a medium climate match overall for the contiguous United States. The range for Climate 6 proportions indicating a medium climate match is between 0.005 and 0.103; the Climate 6 proportion for *Vandellia cirrhosa* was 0.009.

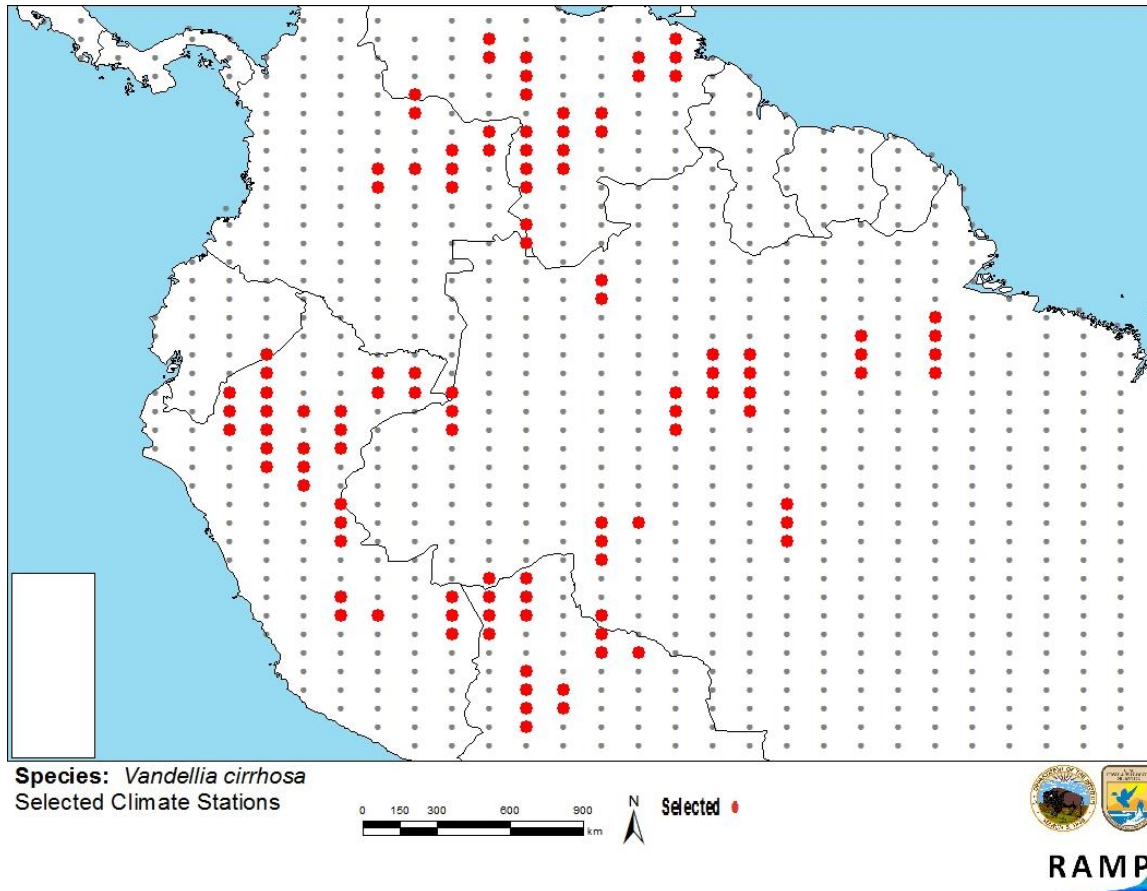


Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations in northern South America selected as source locations (red; Venezuela, Colombia, Ecuador, Peru, Bolivia, Brazil) and non-source locations (gray) for *Vandellia cirrhosa* climate matching. Source locations from GBIF (2016).

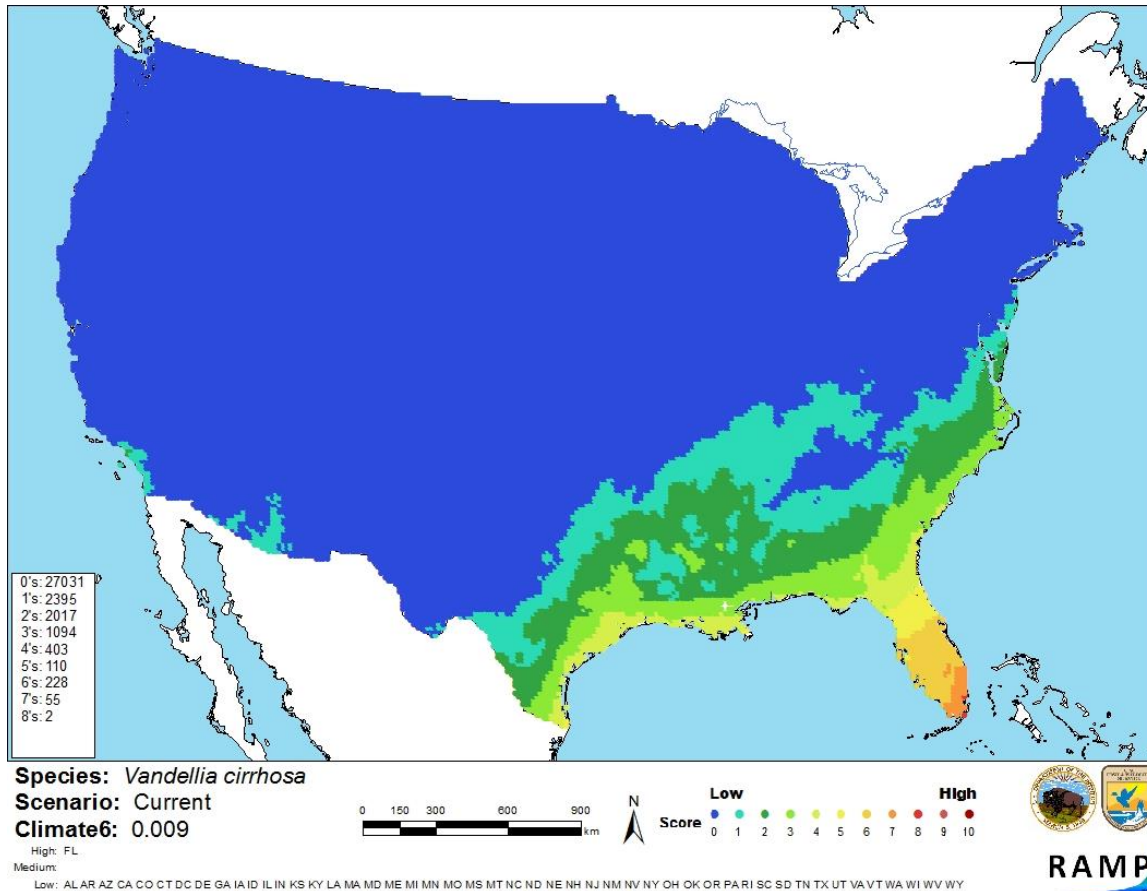


Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *Vandellia cirrhosa* in the contiguous United States based on source locations reported by GBIF (2016). 0= Lowest match, 10=Highest match. Counts of climate match scores are tabulated on the left.

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 somewhat limited information available on the biology of *Vandellia cirrhosa*, and different sources provide different range descriptions. The potential impacts of an introduction are unknown because no introductions of *V. cirrhosa* have been reported previously. Due to this lack of information, the certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Candiru (*Vandellia cirrhosa*) is a small parasitic catfish species native to the Amazon River basin and possibly the Orinoco River basin in South America. The species has not been reported as introduced outside its native range, so impacts of introduction are unknown. Like other trichomycterid catfish, *V. cirrhosa* is listed as a prohibited species in the state of Florida and cannot be possessed or used commercially. It may be traumatogenic in humans. Climate match to the contiguous United States is medium. Overall risk posed by *V. cirrhosa* 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.

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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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Zuanon, J., and I. Sazima. 2004. Vampire catfishes seek the aorta not the jugular: candirus of the genus *Vandellia* (Trichomycteridae) feed on major gill arteries of host fishes. *Aqua, Journal of Ichthyology and Aquatic Biology* 8(1):31-36.