

# Bloodfin Tetra (*Aphyocharax anisitsi*)

## Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, February 2011

Revised, January 2016 and July 2017

Web Version, 10/30/2017



Photo: Carlos Bernardo Mascarenhas Alves. Licensed under CC-BY-NC. Available: <http://www.fishbase.se/photos/UploadedBy.php?autoctr=24776&win=uploaded>. (July 2017).

## 1 Native Range and Status in the United States

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### Native Range

From Gonçalves et al. (2005):

“*Aphyocharax anisitsi* is found in the rios Paraná, Paraguay and Uruguay and the laguna dos Patos drainages in southern South America.”

## Status in the United States

From Nico (2017):

“**Nonindigenous Occurrences:** Several specimens were taken in Florida from two separate stations in the lower Little Manatee River, Hillsborough County, on 15 September 1988 (museum specimens).”

“**Status:** Failed in Florida.”

## Means of Introductions in the United States

From Nico et al. (2017):

“The fish probably escaped from local ornamental fish farms.”

## Remarks

From Nico et al. (2017):

“The genus *Aphyocharax* contains at least 10 species, all of which share the same common name: bloodfin tetras (Géry 1977).”

## 2 Biology and Ecology

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### 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 Characiformes  
Family Characidae  
Genus *Aphyocharax*  
Species *Aphyocharax anisitsi* Eigenmann and Kennedy, 1903”

“Current Standing: valid”

## **Size, Weight, and Age Range**

From Froese and Pauly (2017):

“Maturity:  $L_m$  21.0 [...]”  
Max length : 5.5 cm TL male/unsexed; [Lima 2003]”

## **Environment**

From Froese and Pauly (2017):

“Freshwater; benthopelagic; pH range: 6.0 - 8.0; dH range: ? - 30.”

## **Climate/Range**

From Froese and Pauly (2017):

“Subtropical; 18°C - 28°C [Riehl and Baensch 1991]”

## **Distribution Outside the United States**

Native

From Gonçalves et al. (2005):

“*Aphyocharax anisitsi* is found in the rios Paraná, Paraguay and Uruguay and the laguna dos Patos drainages in southern South America.”

Introduced

From Froese and Pauly (2017):

“To: Philippines [...]”  
Year: 1978 [...]”  
Established in the wild: unknown [ASAP 1996]”

From Júlio Júnior et al. (2009):

“This study analyzes the fish species invasion in the upper part of the rio Paraná basin after the Itaipu Reservoir inundated Sete Quedas Falls, a natural and effective barrier that was the limit of two hydrographic ecoregions (sensu Abell et al., 2008). [...] *Aphyocharax anisitsi* was listed by Langeani et al. (2007) as invasive due to Itaipu. Nevertheless, a single lot mentioned by Souza-Lima (2003), who revised the genus, collected in the upper rio Paraná in 1982, did not allow this conclusion.”

## **Means of Introduction Outside the United States**

From Froese and Pauly (2017):

“Reason: ornamental [ASAP 1996]”

From Júlio Júnior et al. (2009):

“The Itaipu Dam, located 150 km downstream from Sete Quedas, impounded the rio Paraná in 1982 and completely flooded the falls. Therefore, several species endemic to the lower rio Paraná basin successfully colonized and spread over the upper rio Paraná.”

## Short Description

From Terán et al. (2016):

“[...] mouth small, 2-4 teeth in the maxilla, 33 to 34 scales of which 8 or 9 are perforated (plus one isolate pored scale in the peduncle), and between 18-21 anal fin rays, the first rays form a lobule. Each premaxilla has 8 teeth in one series. Teeth are conical or tricuspid. Coloration pattern: background silver, base of pelvic and anal fin red (Géry, 1977; Almirón et al., 2015).”

From Gonçalves et al. (2005):

“Mature males have small bony hooks on several anal and pelvic-fin rays, a putative apomorphic character shared by most characids (Malabarba & Weitzman, 2003). Mature males of this species possess gill glands, which have thus far been described in a few characid species (Burns & Weitzman, 1996; Bushmann et al., 2002).”

From Froese and Pauly (2017):

“Number of hooks present in the anal fin rays and frequency of occurrence of gill glands suggest stage of maturation in males [Gonçalves et al. 2005].”

## Biology

From Froese and Pauly (2016):

“Adults swim mainly in the upper and middle water layers. Feed on worms, small insects and crustaceans [Page and Burr 1991].”

“In the tank, spawning occurs usually in early morning, after a period of very active driving by the male. Female lays numerous glass-clear eggs, sometimes 700 to 800, which sink to the bottom of the tank. Eggs hatch in about 20 to 25 hours [Mills and Vevers 1989].”

From Gonçalves et al. (2005):

“The reproductive period of *Aphyocharax anisitsi* is described through the analysis of specimens collected monthly from April 2001 to March 2002 in the arroio do Salso (30°22'27"S, 55°02'06"W), Rosário do Sul, Rio Grande do Sul, Brazil. The monthly variation of the Gonadosomatic Index mean (GSI) of both males and females allowed the recognition of a defined seasonal reproductive period occurring between September and February, showing a positive correlation with temperature and daylength. Absolute fecundity was 344.8 oocytes and relative fecundity 0.68 oocytes per mg of body weight. Absolute fecundity was correlated with standard length and total body weight. It was possible to identify two categories of males through

the analysis of the number of rays bearing hooks on the anal fin: those with few or no rays bearing hooks identified as young males hatched in the last reproductive season, and those with a higher number of anal-fin rays bearing hooks identified as males that had already reproduced once or that are maturing and participating in their first reproductive period. Once developed, anal-fin rays are maintained permanently.”

From Corrêa et al. (2009):

“*Aphyocharax anisitsi* shows an invertivorous/insectivorous feeding habit [...] *Aphyocharax anisitsi* changed from an invertivorous (dipteran larvae) in the rainy season to terrestrial insects (hymenopterans) feeding habit in the dry season. In other environments, this species has been characterized as a zooplanktivorous (Pouilly et al., 2004; Hahn & Loureiro-Crippa, 2006; Russo & Hahn, 2006), which indicates that it is more flexible in its diet feeding on the most available food resource. These shifts may indicate a strategy that allows a considerable drop in the cost of searching, which maximizes net energy intake in periods of food scarcity (Prejs & Prejs, 1987).”

## Human Uses

From Froese and Pauly (2016):

“Aquarium: highly commercial”

## Diseases

From Takemoto and Lizama (2010):

“The small fish species considered fodder, such as *Aphyocharax anisitsi* [...] were parasitized by several species of parasites in the larval stage, showing that these fish act mainly as intermediate hosts of several species of helminthes, as they serve as food for other fish species and several groups of animals, which are considered definitive hosts, completing the cycle of the parasites. However, these species also harbor some species of parasites in adult stage.”

No OIE-reportable diseases have been identified in this species.

## Threat to Humans

From Froese and Pauly (2016):

“Harmless”

## 3 Impacts of Introductions

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From Nico (2017):

“Unknown.”

## 4 Global Distribution



**Figure 1.** Known global distribution of *Aphyocharax anisitsi*. Map from VertNet (2017). Location in northwestern Bolivia (Amazon River basin) is outside the described range of the species and no evidence was found that the species is established in the Amazon basin. This point was not included in the climate matching analysis.

## 5 Distribution Within the United States

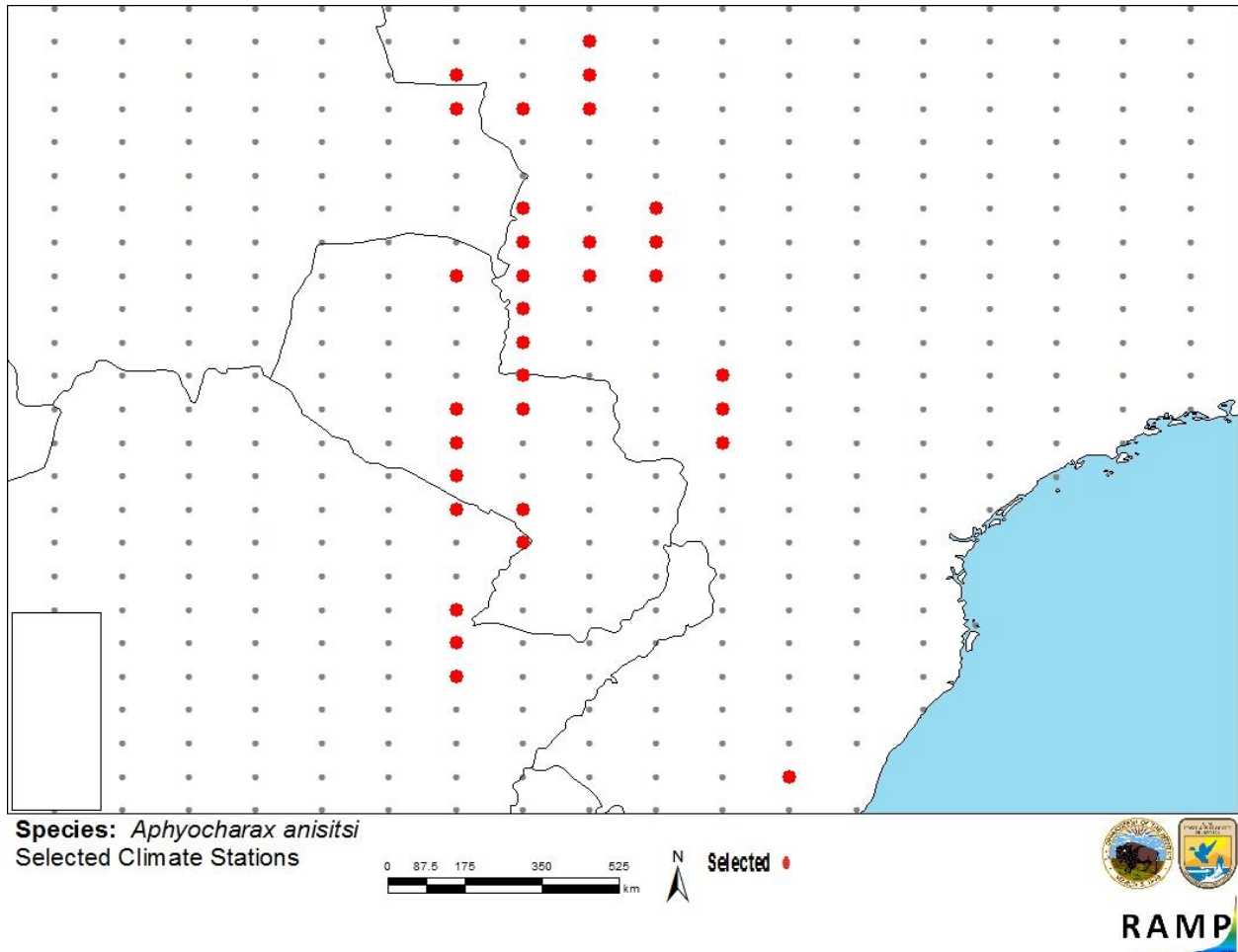


**Figure 2.** Known United States distribution of *Aphyocharax anisitsi*. Map from Nico (2017). The point shown on the map represents two records of a failed population.

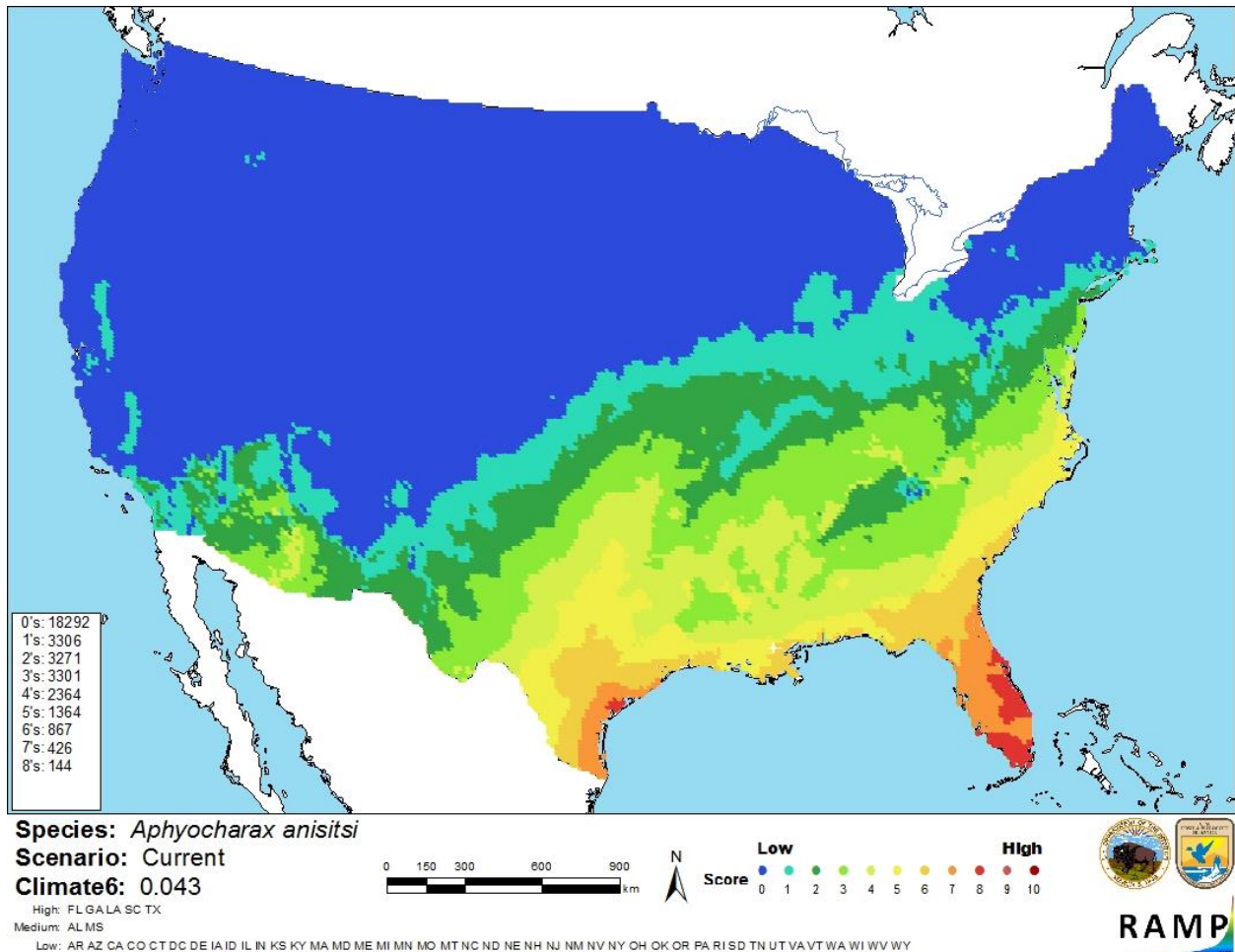
## 6 Climate Matching

### Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables, Euclidean Distance) was rated as “medium” for *A. anisitsi* across the contiguous U.S., based on a Climate 6 proportion of 0.043. The range of proportions indicating a medium climate match is 0.005-0.103. High climate matches occurred in eastern and southern peninsular Florida, and in coastal Texas south of Houston. Much of the southeastern U.S. showed medium climate matches, while the remainder of the contiguous U.S. showed low climate matches.



**Figure 3.** RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red) and non-source locations (gray) for *A. anisitsi* climate matching. Source locations from GBIF (2016) and VertNet (2017).



**Figure 4.** Map of RAMP (Sanders et al. 2014) climate matches for *A. anisitsi* within the contiguous United States based on source locations reported by GBIF (2016) and VertNet (2017). Counts of climate match scores are tabulated on the left side of the map. 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
$0.000 \leq X < 0.005$	Low
$0.005 < X < 0.103$	Medium
$\geq 0.103$	High

## 7 Certainty of Assessment

The biology and ecology of *A. anisitsi* are well documented. There are no documented established populations outside the native range and no documented ecologically destructive characteristics for this species. Because of the lack of information on potential impacts of introduction, certainty of this assessment is low.



## 8 Risk Assessment

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### Summary of Risk to the Contiguous United States

*Aphyocharax anisitsi* is a small fish native to the Paraná River basin and the Laguna dos Patos drainage in South America. It is sold in the ornamental fish trade, and individuals of this species found in the wild in Florida were likely escapees from an ornamental fish farm. No established populations have been identified outside the native range of this species. *A. anisitsi* has a medium climate match to the contiguous U.S., with southeastern states showing the highest climate matches. 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

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**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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