

Black Ghost Knifefish (*Apteronotus albifrons*)

Ecological Risk Screening Summary

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1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2013):

“South America: Venezuela to Paraguay and Paraná rivers. Also in the Amazon Basin of Peru [Ortega and Vari 1986].”

Status in the United States

No records of *Apteronotus albifrons* in the United States were found.

Means of Introductions in the United States

No records of *Apteronotus albifrons* in the United States were found.

Remarks

From de Santana (2002):

“Based on the description of *A[pteronotus]. caudimaculosus* and previous studies (e.g., de Santana, 2002), it is hypothesized that the widespread populations of *A. albifrons*, represent a species complex.”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2013):

“Kingdom Animalia
Phylum Chordata
Subphylum Vertebrata
Superclass Osteichthyes
Class Actinopterygii
Subclass Neopterygii
Infraclass Teleostei
Superorder Ostariophysii
Order Gymnotiformes
Suborder Sternopygoidei
Family Apteronotidae
Genus *Apteronotus* Lacepède, 1800
Species *Apteronotus albifrons* (Linnaeus, 1766)”

“Taxonomic Standing:
Current Status: valid”

From Eschmeyer et al. (2017)”

“*albifrons*, *Gymnotus* Linnaeus [C.] 1766:428 [Systema naturae sive regna tria naturae v. 1 (pt 1); [...]] Suriname. No types known. •Valid as *Apteronotus albifrons* (Linnaeus 1766) -- (Ortega & Vari 1986:12 [...], Mago-Leccia 1994:28 [...], Planquette et al. 1996:404 [...], Albert & Campos-da-Paz 1998:430 [...], Albert & Campos-da-Paz 1998:431 [...], Britski et al. 1999:90 [...], Albert 2001:109 [...], de Santana 2003:8 [...], Albert in Reis et al. 2003:498 [...], López et al. 2003:66 [...], Menni 2004:85 [...], de Santana & Crampton 2006:115 [...], de Santana & Lehmann A. 2006:261 [...], de Santana et al. 2006:277 [...], Triques 2011:300 [...], de Santana & Cox Fernandes 2012:284 [...] also as cf. *albifrons* on p. 290, Litz & Koerber 2014:28 [...], Sarmiento et al. 2014:188 [...], Mirande & Koerber 2015:47 [...], de Santana & Vari 2015:592 [...]). **Current status:** Valid as *Apteronotus albifrons* (Linnaeus 1766). Apteronotidae.”

Size, Weight, and Age Range

From Froese and Pauly (2013):

“Max length: 50.0 cm TL male/unsexed; [Albert 2003]”

Environment

From Froese and Pauly (2013):

“Freshwater; benthopelagic; pH range: 6.0 - 8.0; dH range: 5 - 19. [...]; 23°C - 28°C [assumed to be recommended aquarium temperature range] [Riehl and Baensch 1991]”

Climate/Range

From Froese and Pauly (2013):

“Tropical; [...]”

Distribution Outside the United States

Native

From Froese and Pauly (2013):

“South America: Venezuela to Paraguay and Paraná rivers. Also in the Amazon Basin of Peru [Ortega and Vari 1986].”

Introduced

No records of *Apteronotus albifrons* introductions were found.

Means of Introduction Outside the United States

No records of *Apteronotus albifrons* introductions were found.

Short Description

From GBIF Secretariat (2015):

“The fish is all black except for two white rings on its tail, and a white blaze on its nose, which can occasionally extend into a stripe down its back.”

Biology

From Froese and Pauly (2013):

“The fish swims backwards (reverse swimming) which is characteristic of two foraging behaviors: searching for prey and assessing it. In assessing a potential prey item, it typically scan the prey from tail to head by swimming backwards, then ingest it after a short forward lunge. A scan in the opposite direction - from head to tail by forward swimming - would have the prey located near the tail and out of position for the final lunge [Lannoo and Lannoo 1993].”

“Occurs in rapidly flowing waters of creeks with a sandy bottom. Is a micro-predator of insect larvae [Planquette et al. 1996]. Nocturnal. Possesses a weakly discharging neurogenic electric organ and ampullary electro receptors that are distributed from head to tail [Szabo 1974, Møller 1995].”

Human Uses

From Froese and Pauly (2013):

“Fisheries: of no interest; aquarium: commercial”

Diseases

No records of OIE reportable diseases found.

From Froese and Pauly (2013):

“Fin Rot (early stage), Bacterial diseases”

Threat to Humans

From Froese and Pauly (2013):

“Harmless”

3 Impacts of Introductions

No records of *Apteronotus albifrons* introductions were found.

4 Global Distribution



Figure 1. Known global distribution of *Apteronotus albifrons* in South America. Map from Froese and Pauly (2013).



Figure 2. Known global distribution of *Aptereronotus albifrons*. Locations are in South America. Map from GBIF Secretariat (2015).

GBIF Secretariat (2015) contained records for *A. albifrons* in India and Thailand that were determined not to represent specimens of established populations. The records from India were from unknown evidence; the one record from Thailand is a fish in an aquarium. These data points are not shown in Fig. 2.

5 Distribution Within the United States

No records of *Aptereronotus albifrons* in the United States were found.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Apteronotus albifrons* was low for most of the United States. There is a high match along the Gulf Coast in Texas and for most of Florida. The Climate 6 score (Sanders et al. 2014; 16 climate variables; Euclidean distance) for the contiguous U.S. was 0.022, medium, and Florida and Georgia had individually high climate matches.

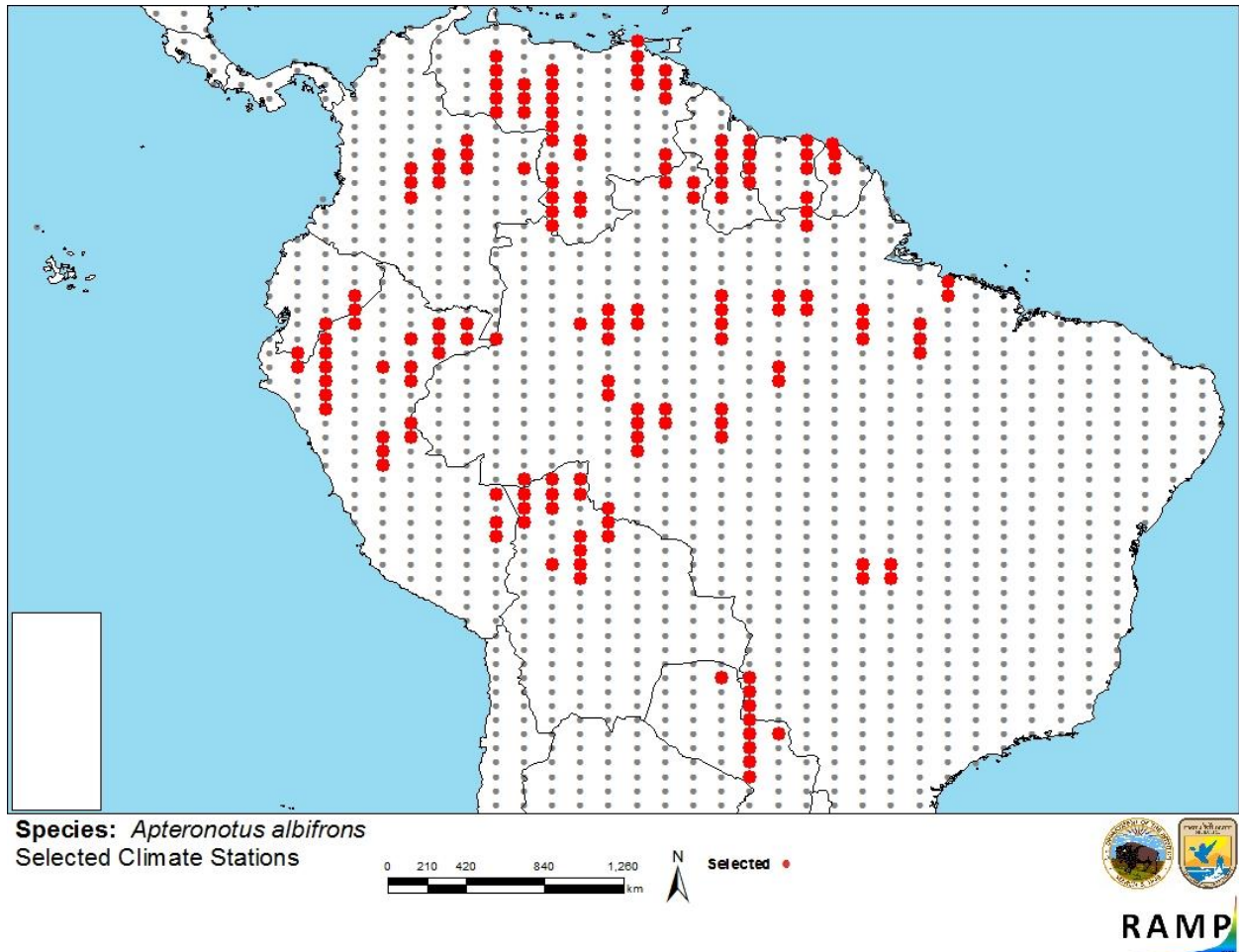


Figure 3. RAMP (Sanders et al. 2014) source map showing weather stations in Venezuela, Colombia, Ecuador, Peru, Brazil, Guyana, Suriname, French Guiana, Bolivia, and Paraguay selected as source locations (red) and non-source locations (grey) for *Apteronotus albifrons* climate matching. Source locations from Froese and Pauly (2013) and GBIF Secretariat (2015).

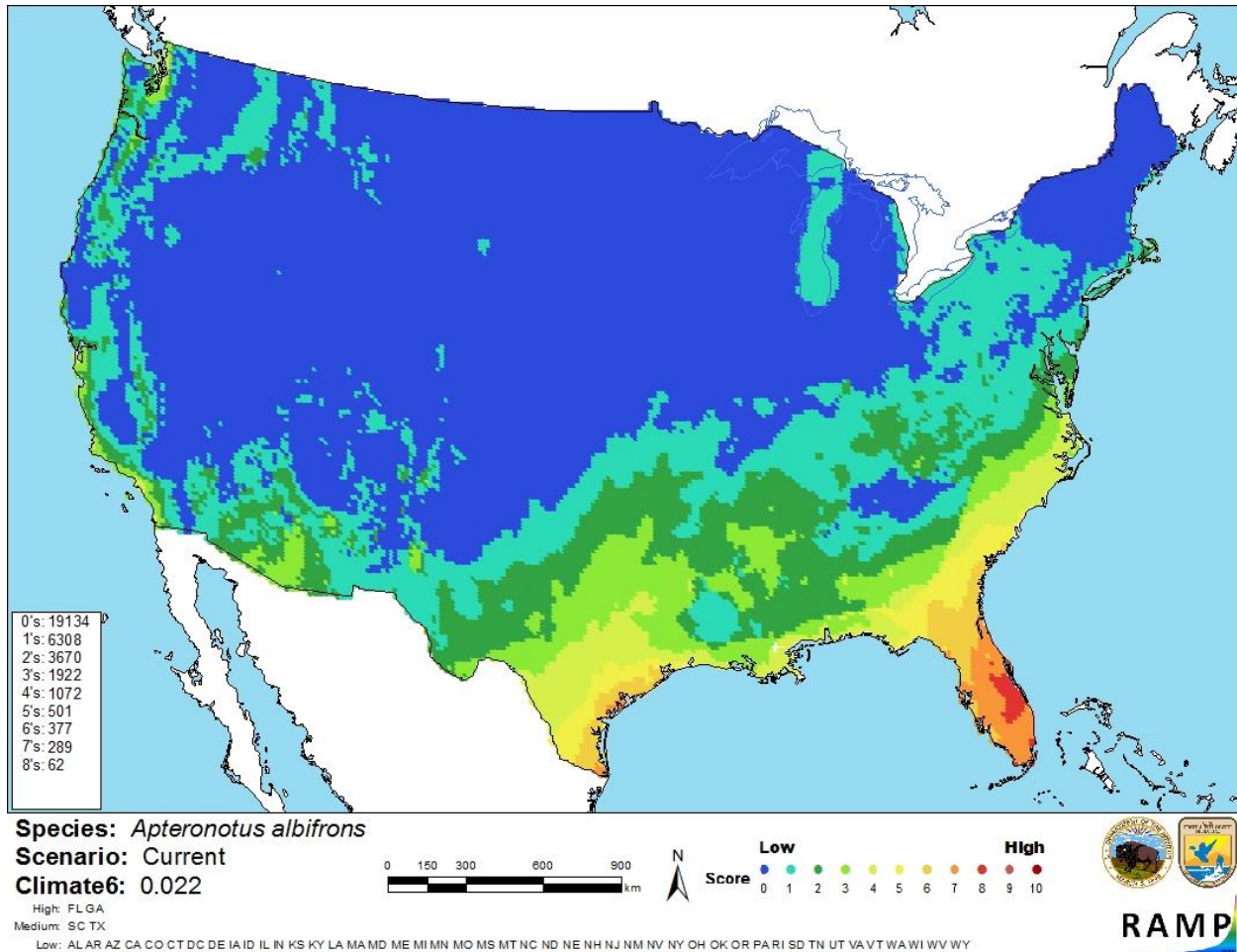


Figure 4. Map of RAMP (Sanders et al. 2014) climate matches for *Apterionotus albifrons* in the contiguous United States based on source locations reported by Froese and Pauly (2013) and GBIF Secretariat (2015). 0 = Lowest match, 10 = Highest match.

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
≥ 0.103	High

7 Certainty of Assessment

The certainty of assessment is low. There is not enough information available to make a determination on history of invasiveness. No records of introductions were found. Information pertaining to *Apterionotus albifrons* was limited in general.

8 Risk Assessment

Summary of Risk to the Contiguous United States

History of invasiveness is uncertain. There were no records of establishment or introduction found. There is anecdotal evidence of the popularity of *Apteronotus albifrons* as an aquarium species, yet no records of accidental introductions through aquarium dumps were found. Climate match was medium. The areas of highest match were Florida and the southern tip of Texas. Certainty of assessment is low. The 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**
- **Remarks/Important additional information:** No additional remarks.
- **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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