Southern Striped Raphael (*Platydoras armatulus*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, February 2022
Revised, February 2022
Web Version, 4/10/2023

Organism Type: Fish
Overall Risk Assessment Category: Uncertain

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1 Native Range and Status in the United States

Native Range

From Fricke et al. (2022):

"South America: Paraná River basin (Argentina, Bolivia, Brazil, Colombia, Paraguay and Uruguay)."

Status in the United States

According to Matlock (2014), the American Fisheries Society included *Platydoras armatulus* on its 2004 and 2013 lists of fish species established in the continental United States.

NatureServe (2022) also states that *Platydoras armatulus* has been recorded in Texas and Florida but does not provide a status for those records and it could not be determined through other sources if those are representative of established wild populations. Identification difficulties may contribute to the uncertainty around the species status in the United States (see Remarks).

Platydoras armatulus has been found in trade in the United States.

From Aqua-Imports (2022):

"Striped Raphael Catfish (*Platydoras armatulus*)

$6.49 – $14.99"

Means of Introductions in the United States

No means of introductions in the wild in the United States were found for *Platydoras armatulus*.

Remarks

From Nico et al. (2023):

"[*Platydoras costatus*] is very similar to a congener, *P. armatulus*, which originates from the Paraguay-Paraná and portions of Amazon and Orinoco basins. Records for *P. costatus* may actually be specimens of *P. armatulus*, e.g., Howells (2001) lists *P. costatus* but the museum collection record for this specimen (ANSP 179206) is identified as *Platydoras cf. armatulus.*"

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

According to Fricke et al. (2022), *Platydoras armatulus* (Valenciennes 1840) is the current valid name for this species. It was originally described as *Doras armatulus* Valenciennes 1840.

From ITIS (2022):

Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Actinopterygii
Class Teleostei
Superorder Ostariophysi
Order Siluriformes
Family Doradidae
Genus *Platydoras*

Species *Platydoras armatulus* (Valenciennes in Cuvier and Valenciennes, 1840)

Size, Weight, and Age Range

From Froese and Pauly (2022):

"Max length : 43.0 cm SL male/unsexed; [Garcia-Ayala et al. 2014] max. published weight: 230.00 g [Giarrizzo et al. 2015]."

From GBIF Secretariat (2022):

"Maximum standard length. 178.0 mm (Graça, Pavanelli, 2007)."

Environment

From Froese and Pauly (2022):

"Freshwater; demersal"

Climate

From Froese and Pauly (2022):

"Subtropical"

Distribution Outside the United States

Native

From Fricke et al. (2022):

"South America: Paraná River basin (Argentina, Bolivia, Brazil, Colombia, Paraguay and Uruguay)."

Introduced

From GBIF Secretariat (2022):

"*Platydoras armatulus* is a non-native species from the upper rio Paraná, and its occurrence can be associated with the filling of the Itaipu Reservoir and the consequent inundation of the Sete Quedas Falls."

From Júlio Júnior et al. (2009):

"Four thorny catfishes successfully invaded the upper rio Paraná after Itaipu: […] *Platydoras armatulus*, […]"

Means of Introduction Outside the United States

From Júlio Júnior et al. (2009):

"[…] we were able to identify 33 species of native fishes in the lower rio Paraná basin that successfully colonized the upper rio Paraná after Itaipu impoundment, that flooded the natural geographic barrier constituted by the Sete Quedas Falls."

Short Description

From GBIF Secretariat (2022):

"Body deep; greatest body depth contained 3.2 to 3.9, head length 3.8 to 4.0 times in SL; snout length contained 2.2 to 2.3, horizontal orbital diameter 4.8 to 5.5 and least interorbital width 2.5 to 2.7 times in HL [head length]; orbital diameter contained 1.8 to 2.1 times in interorbital width. Mouth terminal; with dentigerous plates in both premaxilla and dentary. Lateral line with 27-28 plates. Dorsal fin with I,6, pectoral fin with I,7, pelvic fin with 7 and anal fin with 10-12 rays (Graça, Pavanelli, 2007). Ground color darkbrown above pelvic-fin orign, whitish to yellowish below; yellowish longitudinal band, from dorsal region of head to distal margin of median caudal-fin rays. Dorsal, pelvic, anal and caudal fins hyaline or light-beige; dorsal fin with dark-brown blotch on distal margin; pectoral fin darkbrown, its spine light-beige; caudal fin with one dark-brown longitudinal band on each lobe."

Biology

From Papes and Ladich (2011):

"The neotropical catfish *P. armatulus* [Piorski 1999] was chosen because this group produces two different sound types (swimbladder and pectoral stridulatory sounds) and because it possesses accessory hearing structures (Weberian apparatus)."

"All *P. armatulus* produced sounds by moving the pectoral fins forward (abduction, AB) and backward (adduction, AD), utilizing either one or both fins at the same time. Fish could also move fins without emitting sounds or lock spines in an abducted position."

Human Uses

From Aqua-Imports (2022):

"Striped Raphael Catfish (*Platydoras armatulus*)

$6.49 – $14.99
The Striped Raphael Catfish is a widespread, medium sized Doradid Cat that has been popular in the aquarium hobby for many years."

Diseases

No records of OIE- reportable diseases (OIE 2022) were found for *Platydoras armatulus*.

According to Poelen et al. (2014), *Platydoras armatulus* can be the host to the following parasite: *Proteocephalus renaudi*.

From Virgilio et al. (2021):

"Thus, the present study aims to report, for the first time, the occurrence of *Trypanosoma* spp. in *P. armatuluse* [*sic*] […]"

From Pereira et al. (2015):

"A new species, *Raphidascaroides moraveci* n. sp., is described from the intestine of *Platydoras armatulus* (Valenciennes) […]"

Threat to Humans

From Froese and Pauly (2022):

"Harmless"

3 Impacts of Introductions

Even though there are records of introductions of *Platydoras armatulus* outside of its native range, no information regarding impacts of those introductions were found.

4 History of Invasiveness

Platydoras armatulus was reported as being introduced in upper rio Paraná after the Itaipu impoundment submerged a waterfall that had previously been a natural barrier. However, information about impacts of that introduction could not be found. There were also sources indicating that *P. armatulus* was found in the wild in the United States (Florida, Texas) but specific locations and the status of those supposed introductions was not found. *P. armatulus* is in the aquarium trade but information on the extent of the trade was not available. The history of invasiveness for *P. armatulus* is classified as Data Deficient.

5 Global Distribution

Figure 1. Known global distribution of *Platydoras armatulus*. Observations are reported from Brazil, Columbia, Venezuela, Peru, Bolivia, Paraguay, Suriname, and the United States. Map from GBIF Secretariat (2022). The point in the United States (Texas) was not included in the climate matching analysis because it is not representative of a wild established population.

6 Distribution Within the United States

Some sources state that *Platydoras armatulus* has been recorded in Texas and Florida but they did not provide a status for those records (see section 1), and it could not be determined if those were representative of established wild populations. Figure 1 includes the only known data point for Texas which was not included in the climate matching analysis because it is not representative of a wild established population.

7 Climate Matching

Summary of Climate Matching Analysis

Most of the contiguous United States had a low to medium climate match. There were areas of high match along the Gulf Coast, peninsular Florida, and up the southern Atlantic Coast. Much of the west of the contiguous United States had low climate matches. Northern New England also had low climate matches. Medium climate matches were found along coastal areas of the

Pacific Coast, in patches in southern Arizona and New Mexico. Most of the area from Texas to New York also had medium climate matches. The overall Climate 6 score (Sanders et al. 2021; 16 climate variables; Euclidean distance) for the contiguous United States was 0.081, Medium (scores between 0.005 and 0.103, exclusive, are categorized as medium). All States had a Low individual Climate 6 score except for Arkansas and Virginia, which had Medium individual Climate 6 scores, and Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Texas, which had High individual Climate 6 scores.

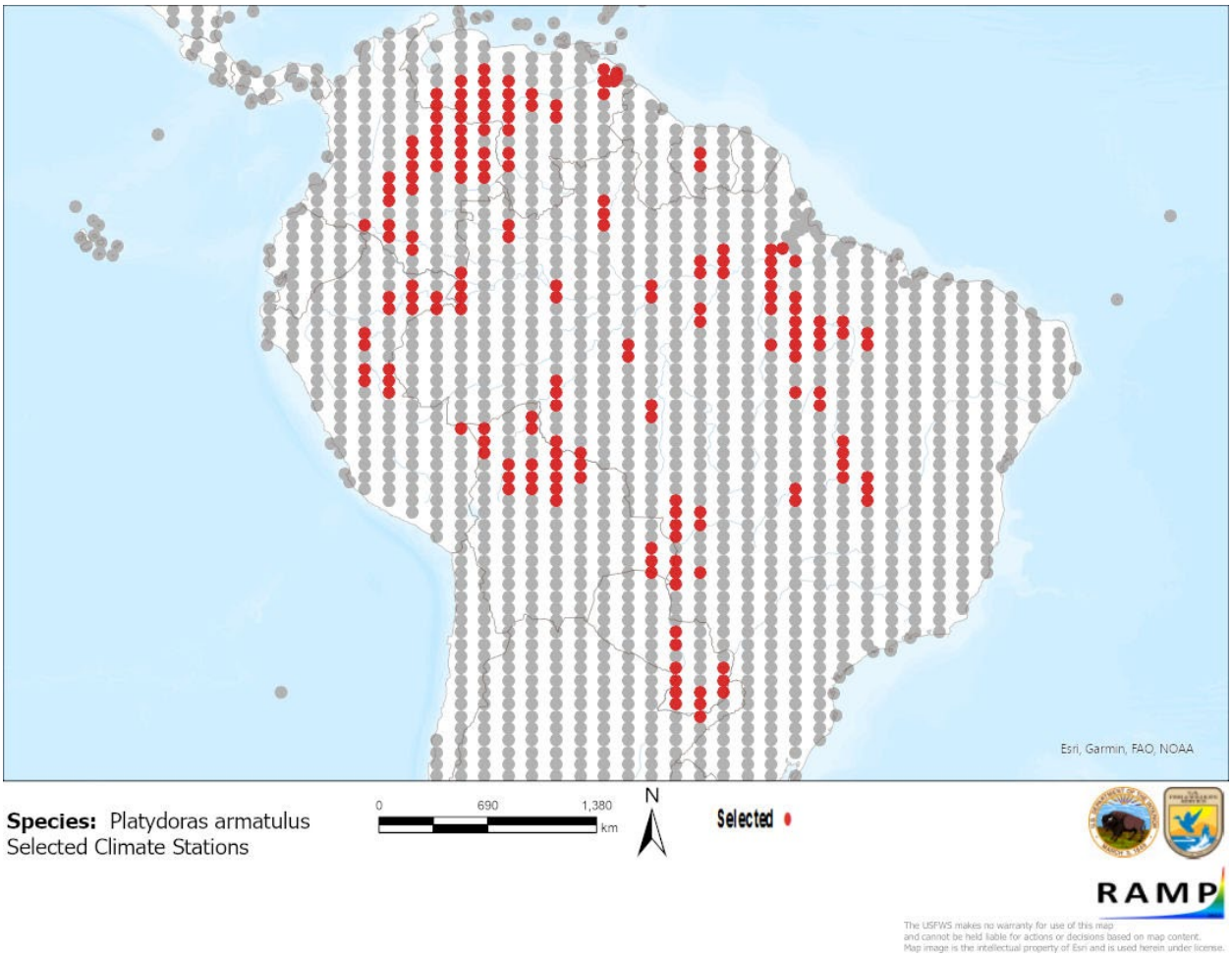

Figure 2. RAMP (Sanders et al. 2021) source map showing weather stations in South America selected as source locations (red; Argentina, Bolivia, Brazil, Colombia, Paraguay, Peru, Suriname, Venezuela) and non-source locations (gray) for *Platydoras armatulus* climate matching. Source locations from GBIF Secretariat (2022). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

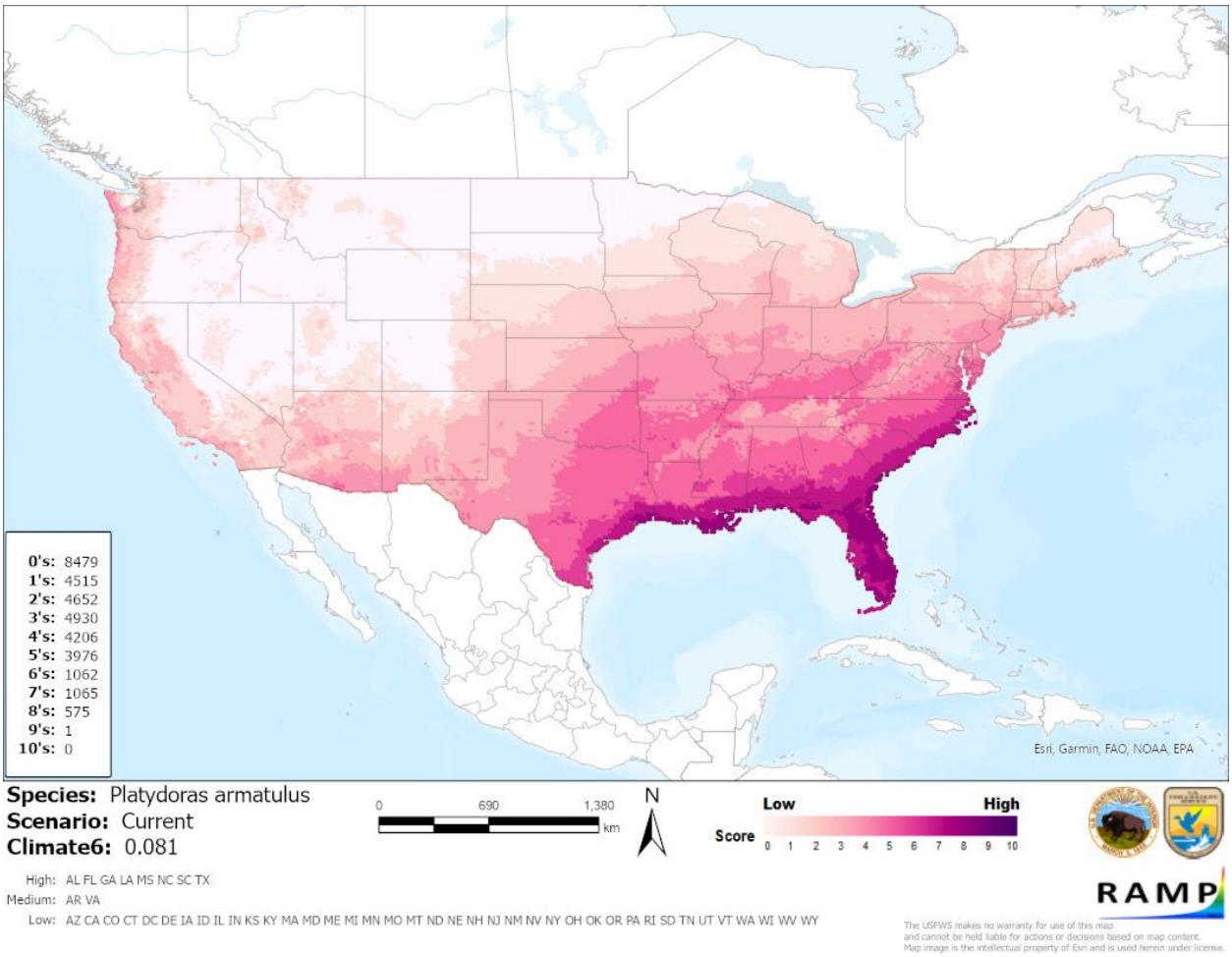

Figure 3. Map of RAMP (Sanders et al. 2021) climate matches for *Platydoras armatulus* in the contiguous United States based on source locations reported by GBIF Secretariat (2022). Counts of climate match scores are tabulated on the left. 0/Light Pink = Lowest match, 10/Dark Purple = Highest match.

The High, Medium, and Low Climate match Categories are based on the following table:

Climate 6: (Count of target points with climate scores 6-10)/ (Count of all target points)	Overall Climate Match Category
0.000≤X≤0.005	Low
0.005<X<0.103	Medium
≥0.103	High

8 Certainty of Assessment

Information is lacking on the biology and ecology of *Platydoras armatulus*. Records of introduction were found with one resulting in a known established population. No information regarding impacts of introduction were found. The species is in trade, but no information was

available regarding trade duration or volume. With the lack of information regarding history of invasiveness, the certainty of assessment is Low.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Platydoras armatulus is a freshwater catfish native to the lower Paraná River basin in South America. *P. armatulus* has been reported as introduced and established in the upper rio Paraná. It has also been recorded in the past in Florida and Texas but there was no evidence suggesting establishment occurred or if the species was still present in those areas. No information was found regarding any impacts of introduction. This species can be found in the aquarium trade, but information regarding trade volume or duration was not found. The history of invasiveness is classified as Data Deficient. The climate match for the contiguous United States is Medium. Areas of medium and high match were found in the southeast, along the Gulf and southern Atlantic coasts. The certainty of assessment is Low due to a lack of information. The overall risk assessment category for *Platydoras armatulus* is Uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 4): Data Deficient**
- **Overall Climate Match Category (Sec. 7): Medium**
- **Certainty of Assessment (Sec. 8): Low**
- **Remarks, Important additional information: It may be difficult to distinguish between specimens of *P. armatulus* and its congener *P. costatus*.**
- **Overall Risk Assessment Category: Uncertain**

10 Literature Cited

Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 11.

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Virgilio LR, Texeira GO, Silva De Melo HP, Prolo Junior SL, Takemoto RM, Camargo LMA, Meneguetti DU. 2022. Infection by *Trypanosoma* spp. in *Platydoras armatulus* (Siluriformes, Doradidae), in Southwestern Amazon, Brazil. Journal of Parasitic Diseases 46:607–612.

11 Literature Cited in Quoted Material

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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