Amazon Leaffish (*Monocirrhus polyacanthus*)
Ecological Risk Screening Summary

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1 Native Range and Status in the United States

Native Range
From Froese and Pauly (2014):

"South America: Amazon River basin in Peru, Brazil, Bolivia, Columbia, and Venezuela."

Status in the United States
No records of *Monocirrhus polyacanthus* in the United States were found.

Means of Introductions in the United States
No records of *Monocirrhus polyacanthus* in the United States were found.

Remarks
No additional remarks.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing
From ITIS (2014):

"Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Osteichthyes
Class Actinopterygii
Subclass Neopterygii
Infraclass Teleostei
Superorder Acanthopterygii
Order Perciformes
Suborder Percoidei
Family Polycentridae
Genus *Monocirrhus* Heckel, 1840
Species *Monocirrhus polyacanthus* Heckel, 1840"

"Taxonomic Status:
Current Standing: valid"

From Eschmeyer et al. (2017):

"***polyacanthus, Monocirrhus*** Heckel [J. J.] 1840:439 [Annalen des Wiener Museums der Naturgeschichte v. 2 […]] Marabitanos, Brazil. Holotype (unique): NMW 76725. •Valid as *Monocirrhus polyacanthus* Heckel 1840 -- (Ortega & Vari 1986:20 […], Britz & Kullander in Reis et al. 2003:603 […], Sarmiento et al. 2014:131, 189 […], Melo et al. 2016:135 […]). **Current status:** Valid as *Monocirrhus polyacanthus* Heckel 1840. Polycentridae."

Size, Weight, and Age Range
From Froese and Pauly (2014):

"Max length : 8.0 cm SL male/unsexed; [Brits and Kullander 2002]"

Environment
From Froese and Pauly (2014):

"Freshwater; benthopelagic; pH range: 5.0 - 6.0; dH range: 5 - 8. […]; 22°C - 25°C [assumed to be recommended aquarium temperature range] [Riehl and Baensch 1991]"

Climate/Range
From Froese and Pauly (2014):

"Tropical; […]"

Distribution Outside the United States
Native
From Froese and Pauly (2014):

"South America: Amazon River basin in Peru, Brazil, Bolivia, Columbia, and Venezuela."

Introduced
According to Li et al. (2007), as referenced in Xiong et al. (2015), *Monocirrhus polyacanthus* is non-native in China but its status is uncertain.

Means of Introduction Outside the United States
See above subsection for vector information from Xiong et al. (2015).

Short Description
From Catarino and Zuanon (2010):

"presents distinct morphological characteristics, such as the absence of a lateral line, a large and protractile mouth, a petiole-like filament in the lower jaw, and a laterally compressed body, strongly resembling a dead leaf in format and color pattern (Nelson, 1994) (Fig. 1 [In source material])."

From Butler (2017):

"Physical description: An oval shaped fish with strong lateral compression. The mouth is large and the lower jaw has a pointed extension. The anal and dorsal fins have long bases and are made up of small spines. The coloration is adaptable to the surroundings. Usually the color ranges from orange-yellow to brown with various markings giving this species the appearance of a dead leaf. A transverse line runs through the eye to the belly, while another runs from the mouth, through the eye and to the caudal fin. The third line runs from the eye to first rays of the dorsal fin."

Biology
From Froese and Pauly (2014):

"Feeds on fish [Mills and Vevers 1989]."

"Produces up to 300 eggs."

From Catarino and Zuanon (2010):

"The diet of the leaf fish was constituted by fish (63.15% FO, n = 12) and invertebrates (36.3% FO, n = 4); fish and invertebrate preys occurred together in three stomachs (15.8% FO). Of the 33 prey found in the stomachs, 21 were fish and 12 invertebrates. Among the consumed prey fishes, Characiformes and Perciformes represented 76.1% and 14.2% respectively. Characidae was the most commonly recorded prey family, followed by Lebiasinidae. Invertebrates were represented by shrimps (Decapoda) and insects (Coleoptera, Hymenoptera, Ephemeroptera and Odonata)."

"The leaf fish *Monocirrhus polyacanthus* typically lives in small terra firme streams, and presents a general body morphology, color pattern, and swimming behavior that remarkably resemble a soaked dead leaf slowly drifting in the water current (Liem, 1970; Britz & Kullander, 2003), which are probably used to facilitate predation. Moreover, the highly protrusible mouth of the leaf fish (which may correspond to 60% of the head length when fully expanded; cf. Waltzek & Wainwright, 2003) may allow an efficient strike after slowly approaching the prey."

Human Uses

From Froese and Pauly (2014):

"Aquarium: commercial"

Diseases

No records of OIE reportable diseases were found.

From Gomez et al. (2006):

"Betanodaviruses are the causative agents of viral nervous necrosis (VNN) in cultured marine fish. […] The brains of the fish and other tissues of the invertebrates were examined by reverse transcriptase-polymerase chain reaction (RT-PCR) and nested PCR to detect betanodavirus. Positive nested PCR results were obtained from the brains of […] and 2 freshwater fish species (South American leaf fish *Monocirrhus polyacanthus* and red piranha *Pygocentrus nattereri*)."

Threat to Humans

From Froese and Pauly (2014):

"Harmless"

3 Impacts of Introductions

No records of impacts from the *Monocirrhus polyacanthus* introduction in China were found.

4 Global Distribution

Figure 1. Known global distribution of *Monocirrhus polyacanthus* in Peru, Brazil, Bolivia, Colombia, and Venezuela. Map from GBIF Secretariat (2017).

No further location information was available for the introduction into China reported in Xiong et al. (2015).

Figure 2. Known global distribution of *Monocirrhus polyacanthus* as reported by VertNet (2017). The database did not have any records of the species in Bolivia.

5 Distribution Within the United States

No records of *Monocirrhus polyacanthus* in the United States were found.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Monocirrhus polyacanthus* was medium for southern parts of Florida and along a small part of the Gulf Coast and low for the rest of the contiguous United States. The Climate 6 score (Sanders et al. 2014; 16 climate variables; Euclidean distance) for the contiguous U.S. was 0.001, low, and no states had an individually high climate match.

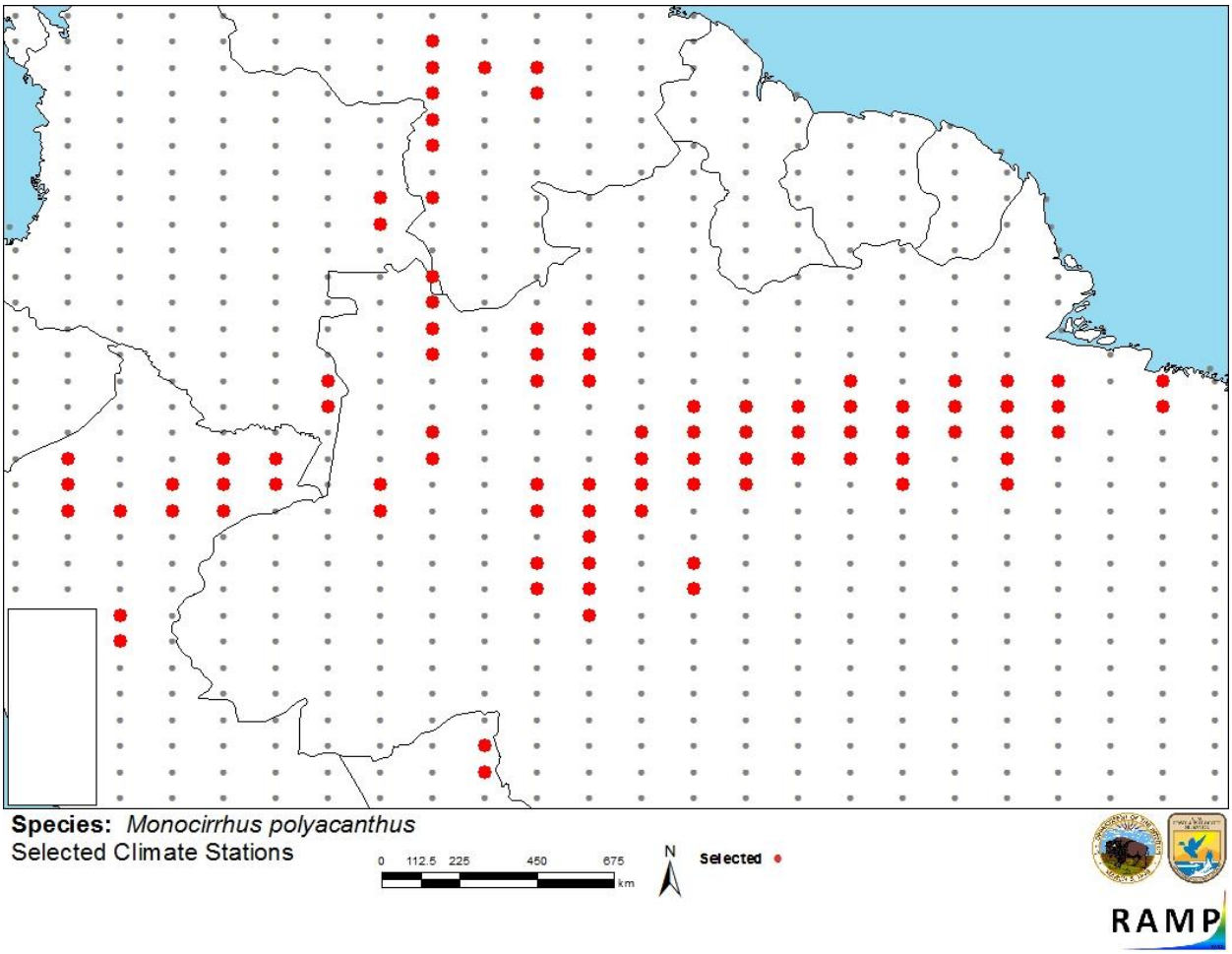

Figure 3. RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red) in Peru, Brazil, Bolivia, Colombia, and Venezuela and non-source locations (grey) for *Monocirrhus polyacanthus* climate matching. Source locations from GBIF Secretariat (2017) and VertNet (2017).

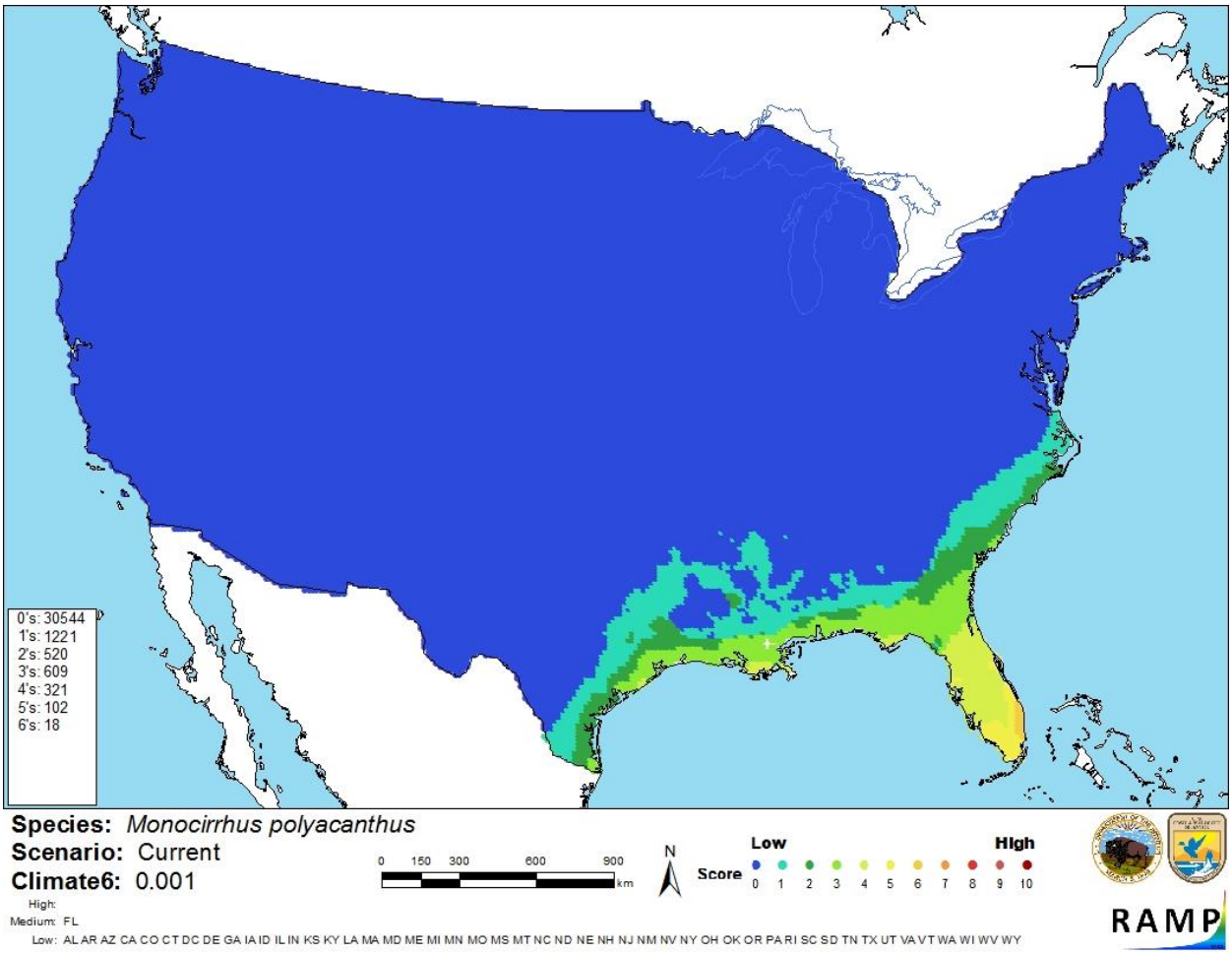

Figure 4. Map of RAMP (Sanders et al. 2014) climate matches for *Monocirrhus polyacanthus* in the contiguous United States based on source locations reported by GBIF Secretariat (2017) and VertNet (2017). 0 = Lowest match, 10 = Highest match.

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

There was minimal information available about *Monocirrhus polyacanthus*. One record of a *M. polyacanthus* introduction into China was found but there were no details about establishment of impacts with the record. The certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

The history of invasiveness for *Monocirrhus polyacanthus* is not documented. One record of an introduction was found. Xiong et al. (2015) lists this species as introduced to China but no information was available beyond that list. Minimal information was available in general about *Monocirrhus polyacanthus*. The climate match was low. The certainty of assessment is low. The overall risk assessment category is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): None Documented**
- **Climate Match (Sec. 6): Low**
- **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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