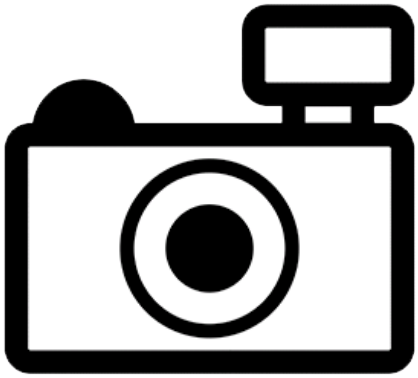
Serrasalmus altuvei (a piranha, no common name)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, April 2012
Revised, July 2018 and August 2019
Web Version, 8/21/2019



No Photo Available

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2018):

"South America: Orinoco River basin in Venezuela."

From Fricke et al. (2019):

"Amazon and Orinoco River basins: Colombia and Venezuela."

Status in the United States

This species has not been reported as introduced or established in the wild in the United States. This species is in trade in the United States, for example:

From AquaScape Online (2018):

"Altuvei Piranha 3″ (*Serrasalmus Altuvei* [*sic*]) […] Our Price: $75.00"

Possession or importation of fish of the genus *Serrasalmus*, or fish known as "piranha" in general, is banned or regulated in many States. Every effort has been made to list all applicable State laws and regulations pertaining to this species, but this list may not be comprehensive.

From Alabama Department of Conservation and Natural Resources (2019):

"No person, firm, corporation, partnership, or association shall possess, sell, offer for sale, import, bring, release or cause to be brought or imported into the State of Alabama any of the following live fish or animals: […] Any Piranha or any fish of the genera *Serrasalmus*, *Pristobrycon*, *Pygocentrus*, *Catorprion*, or *Pygopristus*; […]"

From Alaska State Legislature (2019):

"Except as provided in (b) - (d) of this section, no person may import any live fish into the state for purposes of stocking or rearing in the waters of the state.
(b) Live oysters native to and originating from the Pacific Coast of North America may be imported […]
(c) Ornamental fish not raised for human consumption or sport fishing purposes may be imported into the state, but may not be reared in or released into the waters of the state. Fish wastes and waste water from ornamental fish may not be released directly into the waters of the state.
(d) Weathervane scallops originating from wild stocks or cultured stocks in the Southeastern Alaska and Yakutat Areas may be imported for aquaculture purposes and may be released only into the waters of the Southeastern Alaska and Yakutat Areas under a stock transport permit required by this chapter […]"

From Arizona Office of the Secretary of State (2013):

""Restricted live wildlife" means wildlife that cannot be imported, exported, or possessed without a special license or lawful exemption."

"Fish listed below are considered restricted live wildlife […]
Piranha, all species of the genera *Serrasalmus*, *Serrasalmo*, *Phygocentrus*, *Teddyella*, *Rooseveltiella*, and *Pygopristis* […]"

From Arkansas Game and Fish Commission (2019):

"It is unlawful to import, transport, or possess any species commonly known as […] piranha […]"

"EXCEPTION: These species may be possessed for display and educational purposes by written permit approved by the Commission."

From California Department of Fish and Wildlife (2019):

"All species of piranha are on California's list of restricted animals and cannot be imported, transported, or possessed without a permit."

From Colorado Secretary of State (2019):

"For the following aquatic species or viable gametes thereof, because of the potential for a detrimental affect [*sic*] on existing fish and their habitat in Colorado, and except as enumerated in these regulations, or as authorized in writing by the Division of Wildlife for management purposes only; the release or the importation, transportation, stocking, sale, acquisition or possession for release is prohibited. Persons who have proof of possession issued prior to January 1,1978 or who obtain prior approval from the Division of Wildlife may possess the following species:
a. Piranha: including members of the genera *Serrasalmus, Rooseveltiella*, and *Pygocentrus*."

From Connecticut Secretary of State (2016):

"The importation or possession of piranha of the subfamily: Serrasalminae, genera *Serrasalmus, Serrasalmo, Pygocentrus, Teddyella, Rooseveltiella* and *Pygopristus,* […] is prohibited except that the Commissioner may at his discretion issue permits for the importation and possession, when it is in the public interest, for public display purposes, of specimens of piranha […]"

Serrasalmus altuvei is listed on Florida's Prohibited Nonnative Species List (FFWCC 2019).

From Georgia Department of Natural Resources (2019):

"The animals listed below are examples of the exotic species regulated under Georgia Law. […] The exotic species listed below, except where otherwise noted, may not be held as pets in Georgia. […] Piranha; all species"

From Hawaii Department of Agriculture (2019):

"For example, the following are prohibited from entry or possession by private individuals in the State. […] *Piranhas*"

From Idaho Office of the Administrative Rules Coordinator (2019):

"No person may possess, cultivate, import, ship, or transport any invasive species […] into or through the state of Idaho following the effective date of this rule, unless the person possessing, importing, shipping or transporting has obtained a permit under Section 103, or unless otherwise exempt by this rule, as set forth in Section 104."

"INVASIVE SPECIES – FISH. […]
05. Piranhas, *Serrasalmus* spp., *Rosseveltiella* spp., *Pygocentrus* spp. […]"

From Illinois Department of Natural Resources (2015):

"For the purposes of Section 20-90 of the Fish and Aquatic Life Code [515 ILCS 5/20-90], the Aquatic Life Approved Species List is established. The following aquatic life categories will be

considered approved for aquaculture, transportation, stocking, importation and/or possession in the State of Illinois."

Serrasalmus altuvei does not appear on the Aquatic Life Approved Species List for Illinois.

From Kentucky General Assembly (2019):

"The live aquatic organisms established in subsections (1) through (7) of this section shall not be imported, bought, sold, or possessed in aquaria:
(1) Subfamily Serrasalminae - piranha, piraya, pirae, or tiger characins; […]"

From Louisiana State Legislature (2019):

"No person shall have in possession or sell in this state [Louisiana] a piranha or Rio Grande Cichlid; except that, piranha may be possessed and displayed at the Aquarium of the Americas, Audubon Institute, New Orleans, as authorized by a special permit issued by the department, under conditions the department deems necessary to prevent their introduction into waters of the state."

From Maine Department of Inland Fisheries and Wildlife (2019):

"Unrestricted List […] (no permit needed): Maine law allows the Department to maintain a list of species of fish and wildlife, including tropical fish and invertebrates, which do not require an importation, exhibition, or possession permit, and may be traded by commercial pet shops."

Serrasalmus altuvei does not appear on the Maine Department of Inland Fisheries and Wildlife's Unrestricted List.

From Massachusetts Division of Fisheries and Wildlife (2014):

"All aquarium trade fish may be kept without a permit except species categorically non-exempt pursuant to 321 CMR 9.01(3), and except that the following species are prohibited without a permit: […]
(b) Piranha (*Pygocentrus* spp. and *Serrasalmus* spp.)"

From Mississippi Secretary of State (2019):

"All species of the following animals and plants have been determined to be detrimental to the State's native resources and further sales or distribution are prohibited in Mississippi. No person shall import, sell, possess, transport, release or cause to be released into the waters of the state any of the following aquatic species or hybrids thereof. However, species listed as prohibited may be allowed under a permitting process where environmental impact has been assessed."

"[The list includes all piranhas and all species of] Subfamily Serrasalminae"

From State of Nevada (2016):

"Except as otherwise provided in this section and NAC [Nevada Administrative Code] 504.486, the importation, transportation or possession of the following species of live wildlife or hybrids thereof, including viable embryos or gametes, is prohibited: […]
Piranhas..... All species in the genera *Serrasalmus, Serrasalmo, Pygocentrus, Teddyella, Rooseveltiella* and *Pygopristis*"

From New Mexico Department of Game and Fish (2010):

"Species importation list group IV may be for live non-domesticated animals that are considered dangerous, invasive, undesirable, state or federal listed threatened, endangered, a furbearer or any other species of concern as identified by the director. The importation of these species are prohibited for the general public but may be allowed for, scientific study, department approved restoration and recovery plans, zoological display, temporary events/entertainment, use as service animal or by a qualified expert."

All piranha and pacu (Family Characidae) are listed in Group IV of the Director's Species Importation List for New Mexico.

From New York State Senate (2019):

"No person shall import, export, own, possess, acquire or dispose of live piranha fish (*Serrasalmus, Rooseveltiella* or *Pyrocentrus* [*sic*]), grass carp (*Ctenopharyngodon idella*) or hybrid grass carp within the state without a license or permit issued at the discretion of the department for scientific, biological or exhibition purposes."

From North Carolina Office of Administrative Hearings (2019):

"It shall be unlawful to transport, purchase, possess, sell, or stock in the public or private waters of North Carolina any live individuals of […] piranha; […]"

From Oklahoma Secretary of State (2019):

"Until such time as is necessary for the Department of Wildlife Conservation to obtain adequate information for the determination of other harmful or potentially harmful exotic species, the importation into the State and/or the possession of the following exotic fish or their eggs is prohibited: […]
"Piranha group: *Serrasalmus* spp., *Pygocentrus* spp., *Rooseveltiella* spp., *Catoprion* spp., *Hydrocynus* spp., and *Salminus* spp."

From South Carolina Legislature (2019):

"A person may not possess, sell, offer for sale, import, bring, cause to be brought or imported into this State [South Carolina], or release in this State the following species at any stage of its

life cycle: […] piranha (all members of *Serrasalmus*, *Rooseveltiella*, and *Pygocentrus* genera) […]"

From Texas Parks and Wildlife (2019):

"The organisms listed here are legally classified as exotic, harmful, or potentially harmful. No person may possess or place them into water of this state except as authorized by the department."

"Piranhas, Family Characidae
All species of genera *Catoprion, Pristobrycon, Pygocentrus, Pygopristis,* and *Serrasalmus*"

From Utah Office of Administrative Rules (2019):

"All species of fish listed in Subsections (2) through (30) are classified as prohibited for collection, importation and possession […]
(22) Piranha, (*Serrasalmus,* All species) family Characidae."

From Virginia Department of Game and Inland Fisheries (2019):

"A special permit is required, and may be is- sued [*sic*] by the Department, if consistent with the Department's fish and wildlife management program, to import, possess, or sell the following non-native (exotic) amphibians, fish, mollusks, aquatic invertebrates, and reptiles: […] piranhas […]"

Means of Introduction into the United States

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

Remarks

From Fink and Machado-Allison (2001):

"Jegu and dos Santos (1987) noted a species of *Serrasalmus* characterized by a greatly compressed body, in the lower Rio Negro [Amazon River basin] of Brazil. They identified it as *S. altuvei* Ramirez (1965), originally described from a tributary of the Rio Orinoco in Venezuela. In their paper they described the specimens and compared them with data from the original description by Ramirez. Although they attempted to examine type specimens of *S. altuvei*, those specimens were not available at that time. Subsequently, Jegu et al. (1991) described *S. compressus* from the Rio Madeira of Brazil, comparing it with specimens they considered to be *S. altuvei*. We have determined, however, that the Rio Negro species is not *S. altuvei* […]"

"*Serrasalmus altuvei* was described in *Evencias,* a privately published journal with very limited distribution. The text is brief and there are no photographs. […] The types of *S. altuvei* were originally deposited in MAC (Ministerio de Agricultura y Cria) collections, curated by A. Fernandez-Yepez. When he left MAC, the collection was moved to an aquacultural station near Caracas, where it was neglected and many specimens were lost or damaged. Curators from MBUCV were able to rescue several lots and among them was one paratype of *S. altuvei* […]

Jegu and dos Santos were unable to compare the specimens they identified as *S. altuvei* with the types, which had been misplaced."

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2018):

"Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Actinopterygii
Class Teleostei
Superorder Ostariophysi
Order Characiformes
Family Characidae
Genus *Serrasalmus*
Species *Serrasalmus altuvei* Ramírez, 1965"

From Fricke et al. (2019):

"**Current status:** Valid as *Serrasalmus altuvei* Ramírez 1965. Serrasalmidae."

Size, Weight, and Age Range

From Froese and Pauly (2018):

"Max length : 17.3 cm SL male/unsexed; [Jégu 2003]"

Environment

From Froese and Pauly (2018):

"Freshwater; benthopelagic."

From Seriously Fish (2018):

"Temperature: 76 – 82°C/24 – 28°C [assumed to represent aquarium water temperature]"

"pH: The pH in its natural waters has been recorded over the range 4.5 – 7.0."

"Hardness: 2 – 15°H"

Climate/Range
From Froese and Pauly (2018):

"Tropical"

Distribution Outside the United States
Native
From Froese and Pauly (2018):

"South America: Orinoco River basin in Venezuela."

From Fricke et al. (2019):

"Amazon and Orinoco River basins: Colombia and Venezuela."

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 Nico and Taphorn (1988):

"*S. altuvei* is a rare, small- to medium-sized piranha with deep narrow body and a slender pointed snout […] It has a silver body and a broad, black terminal band on its unpaired fins. None of our specimens had any red."

From Fink and Machado-Allison (2001):

"Some large adult specimens of *S. altuvei* have faint dorsoventrally extended spots forming short vertical stripes, but these are shorter and much less numerous than the vertical stripes of *S. hastatus*."

"There are other, subtle shape differences that also aid in separation [of *S. altuvei* and *S. compressus*]. Among these is the dorsal profile, which in *Serrasalmus compressus* is more concave in the supraorbital region and more convex posterior to the supraoccipital spine than *S. altuvei*. *Serrasalmus compressus* also has a more robust snout laterally than *S. altuvei*. The ventral profile of the belly of many specimens of *S. compressus* ventrally protrudes to a greater extent anteriorly than *S. altuvei*. All of these features are more pronounced in juveniles than in adults."

"Young *S. compressus* have larger and denser spots that extend more fully over the ventral body and belly than in *S. altuvei*, where spotting is sparse below the lateral midline […]"

Biology

From Fink and Machado-Allison (2001):

"It is rare in collections and is apparently rare in the wild."

From Seriously Fish (2018):

"This species' natural waters are to be found in the tropical grasslands of the Llanos in Venezuela. Far-removed from the Amazonian jungle habitats more often associated with Piranha the biotopes here predominantly contain clear, sunlit water and lush growth of aquatic plants. It does not appear to be a widespread species across this range according to collectors' reports and tends to occur singly rather than in groups."

"Wild fish feed mainly on the fins of other species as well as smaller fish. Some *Serrasalmus* have also been shown to eat nuts, fruits and seeds although this is unconfirmed in the case of *S. altuvei*."

From Nico and Taphorn (1988):

"Small juveniles (20-80 mm SL) of six species (*Serrasalmus altuvei, S. irritans, S. cf. elongatus, S. rhombeus, S. caribe*, and *Pristobrycon cf. striolatus*) specialize in fins of other small fishes, but by 80 mm SL their diets shift to small fish, pieces of fish flesh, and fins. […] These savanna piranhas do not depend on fruits and seeds as has been reported for piranhas in flooded tropical rain forests."

Human Uses

From Seriously Fish (2018):

"*S. altuvei* is very scarce in the [aquarium] hobby, most commonly being found among imports of juvenile *S. rhombeus* (the type species of the genus)."

This species is in trade in the United States, for example:

From AquaScape Online (2018):

"Altuvei Piranha 3″ (*Serrasalmus Altuvei* [*sic*]) […] Our Price: $75.00"

Diseases

No OIE-reportable diseases (OIE 2019) have been documented for *S. altuvei*.

From Azevedo and Matos (2003):

"*Henneguya pilosa* sp. n., a new species of myxosporean from the gill filaments of the white piranha, *Serrasalmus altuvei* Ramirez, 1965 (Characidae), a freshwater teleost fish collected in

the Zoological Garden of the city of Teresina (Piauí), Brazil, is described from light and transmission electron microscope observations."

"The prevalence of infection was 30%."

Threat to Humans

From Froese and Pauly (2018):

"Harmless"

3 Impacts of Introductions

No introductions of this species have been reported; therefore, there is no information on impacts of introductions.

The importation, possession, or trade of the piranha *Serrasalmus altuvei* is prohibited or restricted in the following states: Alabama (Alabama Department of Conservation and Natural Resources 2019), Alaska (Alaska State Legislature 2019), Arizona (Arizona Office of the Secretary of State 2013), Arkansas (Arkansas Game and Fish Commission 2019), California (California Department of Fish and Wildlife 2019), Colorado (Colorado Secretary of State 2019), Connecticut (Connecticut Secretary of State 2016), Florida (FFWCC 2019), Georgia (Georgia Department of Natural Resources 2019), Hawaii (Hawaii Department of Agriculture 2019), Idaho (Idaho Office of the Administrative Rules Coordinator 2019), Illinois (Illinois Department of Natural Resources 2015), Kentucky (Kentucky General Assembly 2019), Louisiana (Louisiana State Legislature 2019), Maine (Maine Department of Inland Fisheries and Wildlife 2019), Massachusetts (Massachusetts Division of Fisheries and Wildlife 2014), Mississippi (Mississippi Secretary of State 2019), Nevada (State of Nevada 2016), New Mexico (New Mexico Department of Game and Fish 2010), New York (New York State Senate 2019), North Carolina (North Carolina Office of Administrative Hearings 2019), Oklahoma (Oklahoma Secretary of State 2019), South Carolina (South Carolina Legislature 2019), Texas (Texas Parks and Wildlife 2019), Utah (Utah Office of Administrative Rules 2019), and Virginia (Virginia Department of Game and Inland Fisheries 2019).

4 Global Distribution

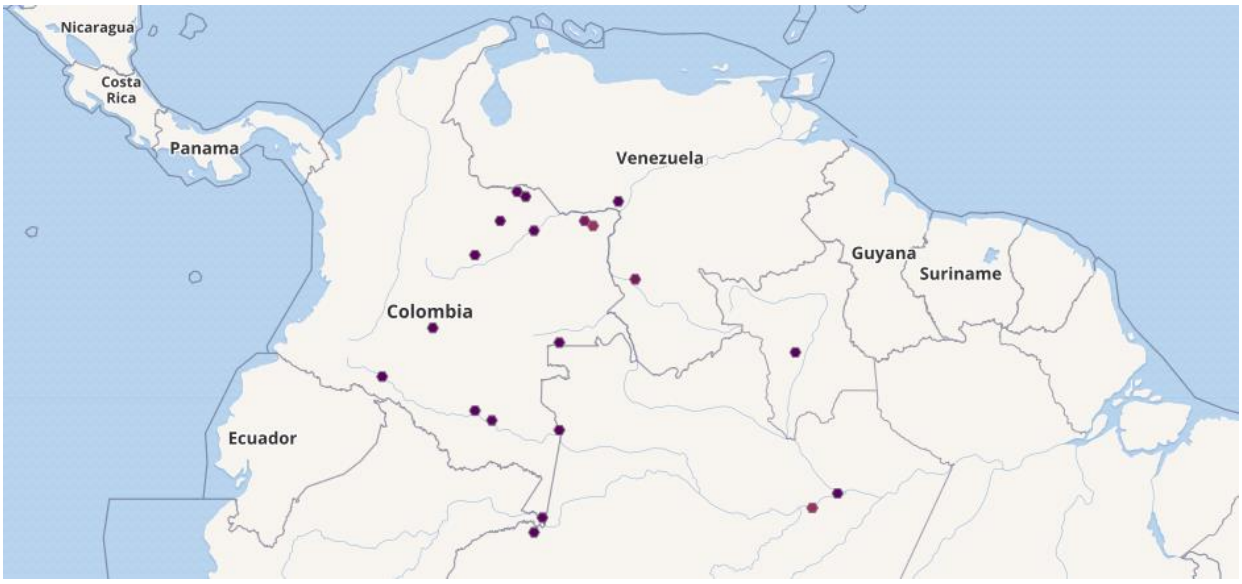


Figure 1. Reported global distribution of *Serrasalmus altuvei*, reported from northern South America. Map from GBIF Secretariat (2017). Only occurrences located in the Orinoco River basin (Venezuela and east-central Colombia) were included in the climate matching analysis. Species identification in the Amazon River basin (Brazil and southern Colombia) is a subject of debate and occurrences there may be the result of misidentification (see Remarks, above).

5 Distribution within the United States

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

6 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Serrasalmus altuvei* (Sanders et al. 2018; 16 climate variables; Euclidean Distance) was low throughout the contiguous United States. The highest climate match occurred in southern Florida; however, this match is still considered low. The Climate 6 score for the contiguous United States was 0.000. This score is classified as a low overall climate match (scores between 0.000 and 0.005, inclusive, are classified as low). Furthermore, all States had low individual Climate 6 scores.

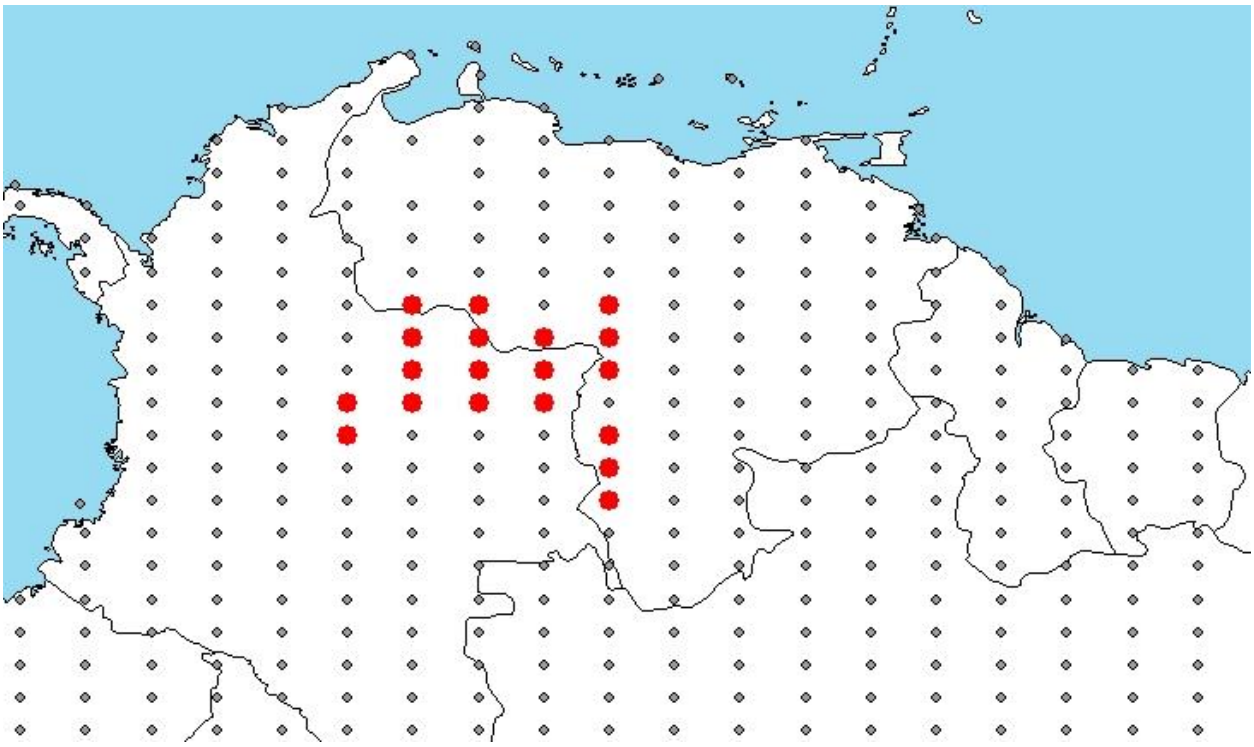


Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in northern South America selected as source locations (red; Venezuela, Colombia) and non-source locations (gray) for *S. altuvei* climate matching. Source locations from GBIF Secretariat (2017).

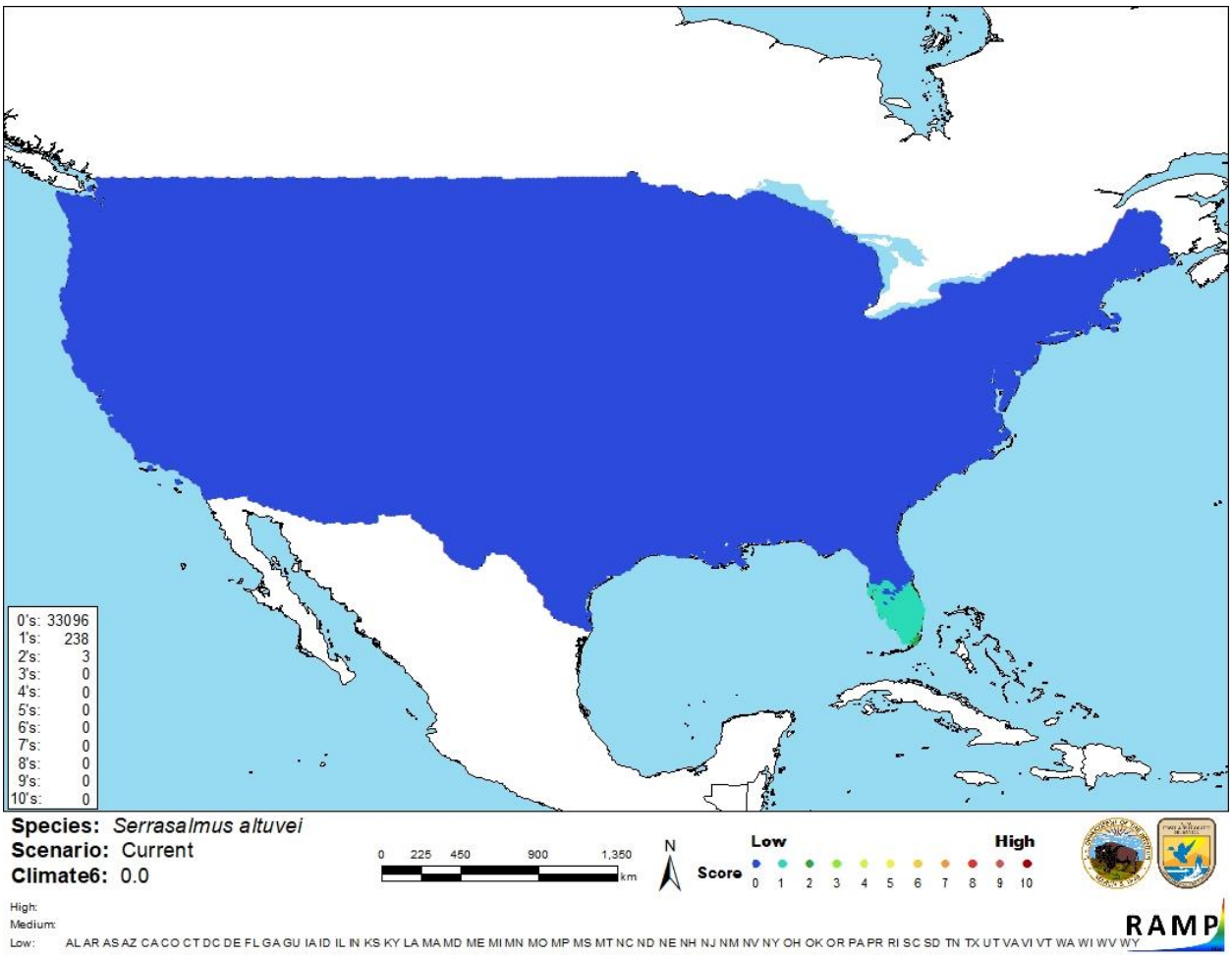


Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *S. altuvei* in the contiguous United States based on source locations reported by GBIF Secretariat (2017). 0=Lowest match, 10=Highest match.

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

Limited information is available on the biology, ecology, and distribution of *Serrasalmus altuveli*. The species is rare in the wild and in captivity, and has been confused with other *Serrasalmus* species. There is a lack of consensus on the native distribution. No introductions of *S. altuveli* have been reported, so no information is available on impacts of introduction. The certainty of this assessment for *S. altuvei* is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Serrasalmus altuvei is a species of piranha native to the Orinoco River basin in northern South America. It is present but rare in the aquarium trade. No introductions of *S. altuvei* have been reported, so the history of invasiveness is uncertain. Climate match to the contiguous United States is low. Due to lack of information, the certainty of assessment is low. The overall risk assessment category for *S. altuvei* is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): Uncertain**
- **Climate Match (Sec. 6): Low**
- **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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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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