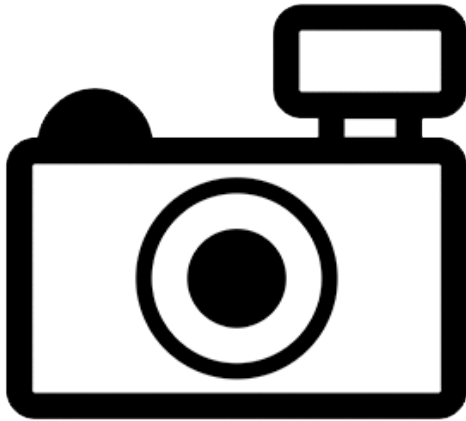


***Serrasalmus irritans* (a piranha, no common name)**

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, April 2012
Revised, July 2018
Web Version, 7/15/2020

Organism Type: Fish
Overall Risk Assessment Category: Uncertain



No Photo Available

1 Native Range and Status in the United States

Native Range

From Eschmeyer et al. (2018):

“Orinoco River basin, Venezuela and Colombia.”

Bogotá-Gregory and Maldonado-Ocampo (2006) report *S. irritans* from the Putumayo basin in Colombia, a sub-basin of the Amazon.

Status in the United States

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

This species is in trade in the United States. For example:

From AquaScapeOnline (2018):

“Irritans Piranha 3"-4" (*Serrasalmus Irritans* [sic]) [...]

One of the most aggressive piranhas rarely available for sale. Limited stock available...

Our Price: \$250.00”

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*, *Phygocestrus*, *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*, *Roosevelthiella*, 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 [...]”

FFWCC (2019) lists *S. irritans* as a prohibited nonnative species in Florida.

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 irritans 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 irritans 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 (2018):

“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 United States.

Remarks

From Seriously Fish (2018):

“Most experts agree that a detailed revision of *Serrasalmus* is necessary, as historically the genus has been viewed as something of a “catch-all” for similar-looking fin-biting/predatory characins. The juvenile forms of numerous species look broadly similar, characteristically developing the more distinctive adult patterning as they mature. This has resulted in new species being erected erroneously and there have been several attempts to reorganise the group. The most recent major revision was undertaken by Géry in the late 1970s, but a handful of new species have been described since then.”

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 irritans* Peters, 1877

From Eschmeyer et al. (2018):

“**Current status:** Valid as *Serrasalmus irritans* Peters 1877. Serrasalmidae.”

Size, Weight, and Age Range

From Froese and Pauly (2018):

“Max length : 13.8 cm SL male/unsexed; [Jégu 2003]”

Environment

From Froese and Pauly (2018):

“Freshwater; benthopelagic.”

Climate

From Froese and Pauly (2018):

“Tropical”

Distribution Outside the United States

Native

From Eschmeyer et al. (2018):

“Orinoco River basin, Venezuela and Colombia.”

Bogotá-Gregory and Maldonado-Ocampo (2006) report *S. irritans* from the Putumayo basin in Colombia, a sub-basin of the Amazon.

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):

“It has a moderately pointed snout [...]”

From Urbano-Bonilla et al. (2018):

“Posterior margin of caudal fin hyaline, with black vertical bar at base of caudal fin”

From Freeman et al. (2007):

“[...] highly compressed bodies [...]”

Biology

From Nico and Taphorn (1988):

“*S. irritans* is a very common piranha, usually second only to *P[ygocentrus] notatus* in numbers of individuals.”

“Stomachs of the young of this piranha were typically packed with only fins, mostly of fishes smaller or similar in size to the predator. It was usually not possible to identify the fins eaten, but the thick red anal fins of *P. notatus* were found in two individuals. Large *S. irritans* preyed mostly on small whole fish, fish flesh, fins, and occasionally scales. Fishes eaten whole or in pieces by *S. irritans* included characids (*C[tenobrycon] spilurus*, *O[dontostilbe] pulcher* and *Hemigrammus* sp.), curimatids (e.g., *C[urimata] metae*), gymnotids, and cichlids (e.g., *M[icrogeophagus] ramirezi*). A small juvenile *P. notatus* was found in the stomach of one individual. No nonfish vertebrate remains were found.”

“In aquaria, fin eaters (e.g., *S. altuvei*, *S. cf elongatus*, and *S. irritans*) typically bite off and swallow fins of live fish, but ignore dead or wounded fish lying on the bottom. In streams and pools, piranhas often conceal themselves beneath floating mats of vegetation, where they can observe and attack other fishes. Like most characoids, piranhas are active mainly during the day and near dusk.”

From Winemiller (1990):

“The top predator during the wet season was the fin-nipping piranha, *Serrasalmus irritans* (Characidae).”

“*Serrasalmus irritans* was primarily a stealth predator of open water habitat and, to a lesser extent, of the edges of structures.”

Human Uses

This species is in trade in the United States. For example:

From AquaScapeOnline (2018):

“Irritans Piranha 3"-4" (*Serrasalmus Irritans* [sic]) [...]

One of the most aggressive piranhas rarely available for sale. Limited stock available...

Our Price: \$250.00”

Diseases

No information available. No OIE-reportable diseases (OIE 2019) have been reported for this species.

Threat to Humans

From Froese and Pauly (2018):

“Harmless”

3 Impacts of Introductions

No information available. No introductions of this species have been reported.

The importation, possession, or trade of the piranha *Serrasalmus auriventris* 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 2018), 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 History of Invasiveness

No reports of *Serrasalmus irritans* introductions were found. This species is present in the aquarium trade, but there are limited data on trade volume. Therefore, history of invasiveness is classified as No Known Nonnative Population.

5 Global Distribution



Figure 1. Known global distribution of *S. irritans* reported from Colombia and Venezuela. Map from GBIF Secretariat (2017). Occurrences reported by GBIF Secretariat (2017) from western Brazil, Bolivia, and the southern Pacific Ocean (not shown here) were excluded from the climate matching analysis and this image because *S. irritans* is not known to be established in those locations.

6 Distribution Within the United States

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

7 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2018; 16 climate variables; Euclidean Distance) was medium across most of peninsular Florida, southern Texas near Brownsville, coastal Washington near Seattle, and in scattered locations along the California coast. The remainder of the contiguous United States had a low climate match. The Climate 6 score indicated that the contiguous United

States had a low climate match overall (scores between 0.000 and 0.005, inclusive are classified as low). The Climate 6 score for *S. irritans* was 0.000. All States had individually low climate scores, except Florida, which had a medium climate score.

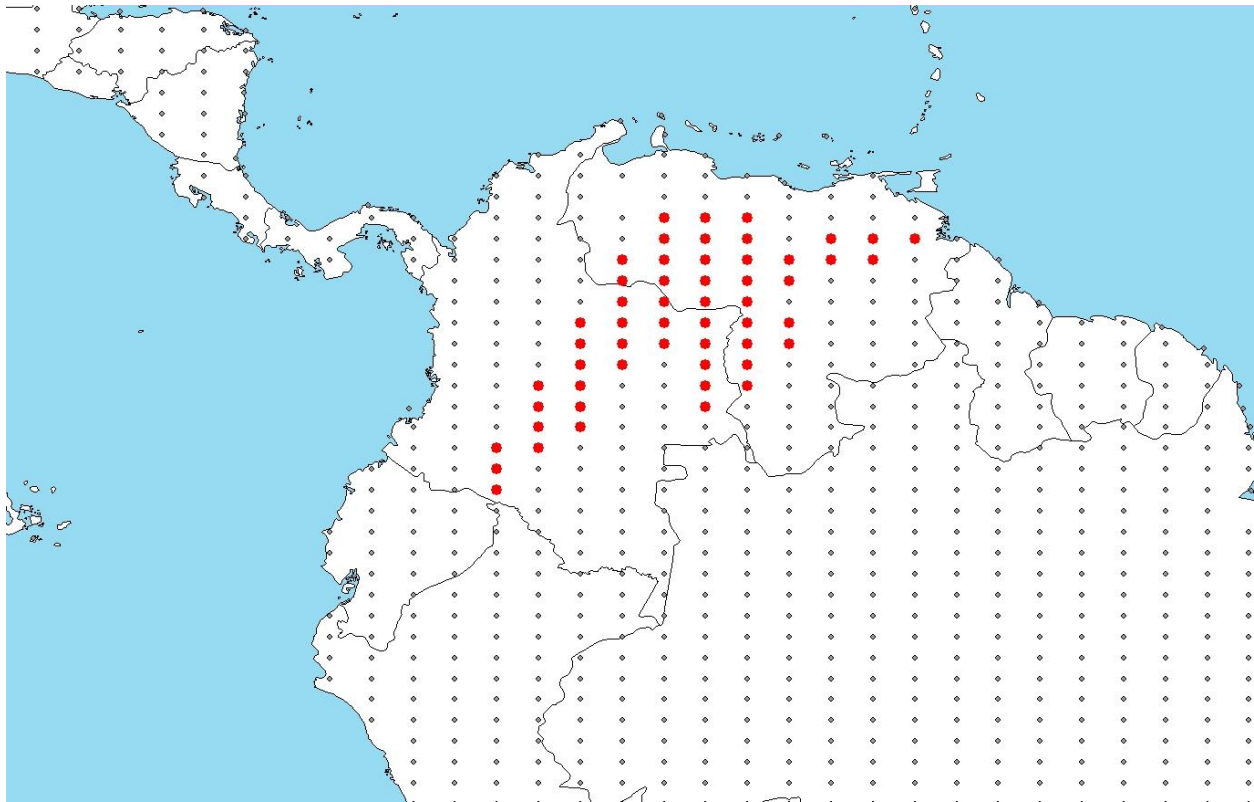


Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in northern South America selected as source locations (red; Colombia, Venezuela) and non-source locations (gray) for *S. irritans* climate matching. Source locations from GBIF Secretariat (2017). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

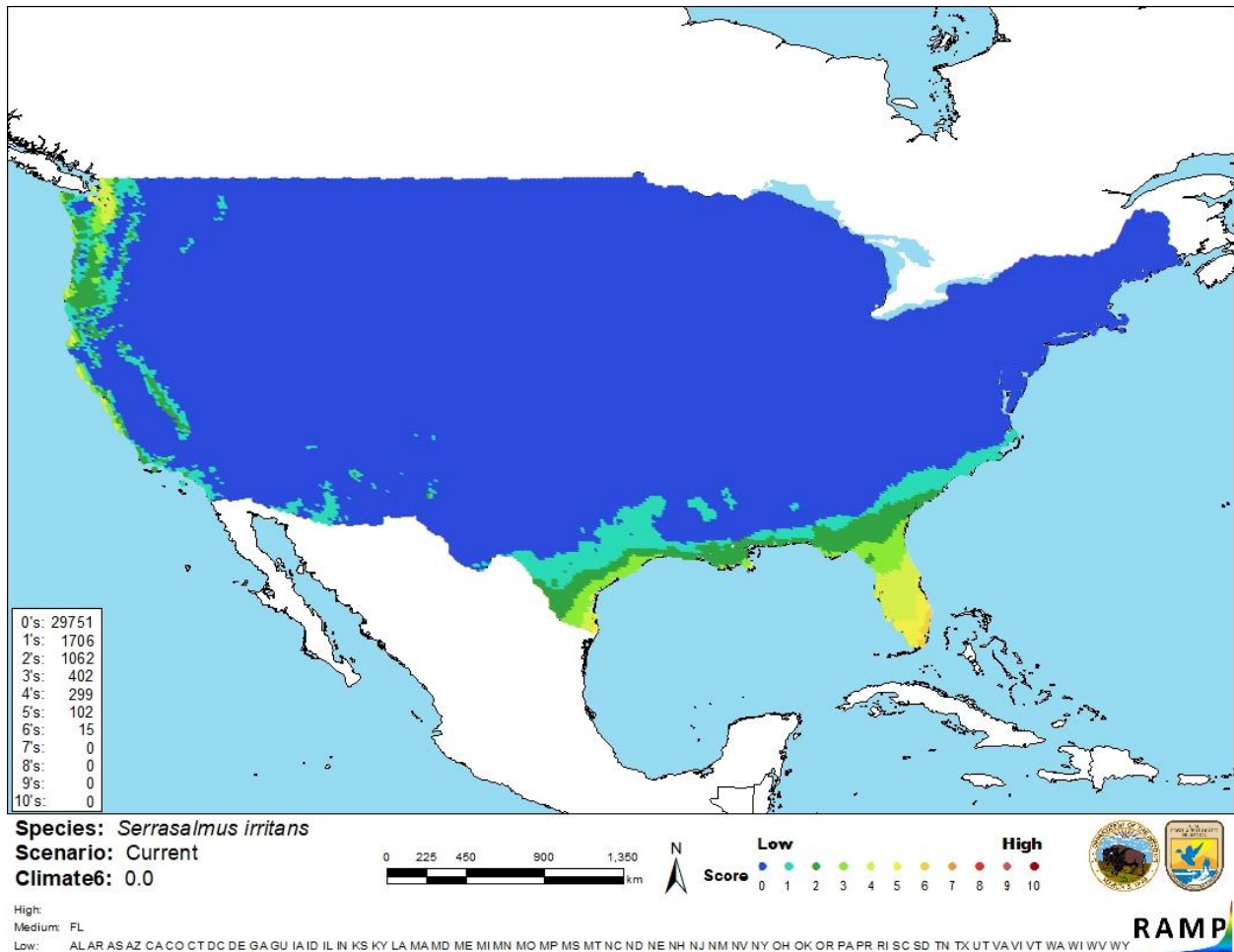


Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *S. irritans* in the contiguous United States based on source locations reported by GBIF Secretariat (2017). Counts of climate match scores are tabulated on the left. 0/Blue = Lowest match, 10/Red = Highest match.

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
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
≥ 0.103	High

8 Certainty of Assessment

Some information is available on the biology, ecology, and distribution of *Serrasalmus irritans*. However, no introductions of this species have been reported, so any impacts of introduction remain unknown. For that reason, certainty of this assessment is low.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Serrasalmus irritans is a species of piranha native to Venezuela and Colombia. It is an abundant top predator in its native range, feeding on fish including fins and scales. No introductions of this species have been reported, and impacts of its introduction remain unknown. History of invasiveness is classified as No Known Nonnative Population. This species is present in the aquarium trade in the United States, although numerous States have prohibited or restricted the trade and possession of this and other piranha species. The Climate match to the contiguous United States was low, however, much of peninsula Florida, the southern tip of Texas, and small areas along the west coast had a medium match. Certainty of assessment is low due to lack of information. Because of the lack of introduction history for *S. irritans* and the low climate match, the overall risk posed by *S. irritans* is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 4): No Known Nonnative Population**
- **Climate Match (Sec. 7): Low**
- **Certainty of Assessment (Sec. 8): Low**
- **Remarks, Important additional information: None**
- **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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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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