

Agassiz's Dwarf Cichlid (*Apistogramma agassizii*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, November 2020

Revised, December 2020

Web Version, 9/3/2021

Organism Type: Fish

Overall Risk Assessment Category: Uncertain



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[https://commons.wikimedia.org/wiki/File:Apistogramma_agassizii_\(Wroclaw_zoo\)-2.JPG](https://commons.wikimedia.org/wiki/File:Apistogramma_agassizii_(Wroclaw_zoo)-2.JPG)
(December 2020).

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2020):

“South America: Amazon River basin, along Amazon-Solimões River from Peru through Brazil to the Capim River basin.”

From de Oliveira et al. (2017):

“The distribution of *A. agassizii* extends across the South American continent from the foot of the Peruvian Andes to the Amazon delta, localities for members of this complex lie not only in the main river itself, but also in the lower to middle courses of numerous tributaries as well as in the entire drainage region of the Negro river (Römer, 2006).”

Status in the United States

There are no records of *Apistogramma agassizii* being established in the United States. It is in trade in the United States as an aquarium fish.

From Aqua Imports (2020):

“Double Red Agassizi Dwarf Cichlid (*Apistogramma agassizi* [sic] ‘double red’)

\$14.99”

New Mexico Department of Game and Fish (2010) lists all species of Cichlidae except *Tilapia* spp. and *Sarotherodon* spp., as part of Group I under the special permits program. *Apistogramma agassizii* is part of Group I and is “designated semi-domesticated animals and do not require an importation permit;”

All species of *Apistogramma* are included on Hawaii’s Conditional Animal List (Hawaii Department of Agriculture 2019).

Means of Introductions in the United States

No records of *Apistogramma agassizii* in the wild in the United States were found.

Remarks

From Estivals et al. (2020):

“This study assessed the taxonomic status of 1,151 specimens of *A. agassizii* collected from 35 sites around Iquitos in the Peruvian Amazon. On the basis of molecular analyses (nuclear and mitochondrial DNA) and mate choice experiments, at least three biological species within the nominal *A. agassizii* were evidenced in the sampling area, which is extremely small compared with the known distribution of the species as initially described.”

“[...] the assumed wide distribution of *A. agassizii* throughout the Amazon is rather atypical for species of the genus [*Apistogramma*]. Several authors have suggested that such a wide range could encompass more than one distinct species (Britzke, 2015; Koslowski, 2002; Römer, 2000, 2006; Römer et al., 2017; Tougaard et al., 2017). Our study in the small portion of the Peruvian Amazon investigated clearly shows that there are at least three entities that are represented as separate ‘genotypic clusters’, or biological and phylogenetic species (Cracraft, 1989; Hennig, 1966; Mallet, 1995; Mayden & Wood, 1995; Mayr, 1942), but at present confounded under the name of *A. agassizii*.”

Information was searched for using the valid name *Apistogramma agassizii* and the synonyms *Geophagus agassizii* and *Apistogramma parva*.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

According to Fricke et al. (2020), *Apistogramma agassizii* (Steindachner, 1875) is the current valid name for this species. It was originally described as *Geophagus agassizii* (Steindachner, 1875) and was historically known by the synonym *Apistogramma parva*.

From ITIS (2020):

Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Actinopterygii
Class Teleostei
Superorder Acanthopterygii
Order Perciformes
Suborder Labroidei
Family Cichlidae
Genus *Apistogramma*
Species *Apistogramma agassizii* (Steindachner, 1875)

Size, Weight, and Age Range

From de Oliveira et al. (2017):

“*Apistogramma agassizii* can reach up to six centimeters in total length, [...]”

“The males were always greater in length and weight than females, [...]”

From Froese and Pauly (2020):

“Max length : 4.2 cm SL male/unsexed; [Kullander 2003]”

Environment

From Froese and Pauly (2020):

“Freshwater; benthopelagic; pH range: 5.0 - 7.0; dH [degrees of hardness] range: ? – 12[...]; 26°C - 29°C [assumed to be recommended aquarium temperature range] [Schliewen 1992]”

Climate

From Froese and Pauly (2020):

“Tropical; [...]”

Distribution Outside the United States

Native

From Froese and Pauly (2020):

“South America: Amazon River basin, along Amazon-Solimões River from Peru through Brazil to the Capim River basin.”

From de Oliveira et al. (2017):

“The distribution of *A. agassizii* extends across the South American continent from the foot of the Peruvian Andes to the Amazon delta, localities for members of this complex lie not only in the main river itself, but also in the lower to middle courses of numerous tributaries as well as in the entire drainage region of the Negro river (Römer, 2006).”

Introduced

No records of introductions were found for *Apistogramma agassizii*.

Means of Introduction Outside the United States

No records of introductions were found for *Apistogramma agassizii*.

Short Description

From Kullander (1980):

“Length of head 29.5–38.4 %, body depth 26.8–35.5 % of SL [standard length]. CP [caudal peduncle depth] length 71.7–111.1 % of CP depth. D [dorsal]. XV [spines]. 6–8 [rays], XVI.5–7.i, XVII.6–7, A [anal]. (II.6), III.5–7, IV.–. Squ. long. [The number of scales in a longitudinal series from the last body scale forwards in the series above that including the lower lateral line] 22–24. [gill] Rakers 0–4: Preoperculum occasionally serrate (2–33 denticuli). Dorsal fin without produced lappets. Caudal fin with a median streamer in adult males, rounded in females and young. Lateral spot occasionally absent in adult males. Abdominal stripes in at least upper Solimoes and Lago Tefé populations, in females and young males. Pectoral spot small. No caudal spot. Midventral stripe occasionally present. Bars only in juveniles. No chest blotch.

Dorsal fin dark anteriorly. Caudal fin with extension of lateral band along middle; in females and young males usually spotted on middle rays; in adult males a broad dark distal seam. (226 specimens of both sexes, 11.5–41.9 mm SL).”

“Body elongate. Head moderately elongate. Predorsal contour gently arched or arched to between orbits, straight rostrally. Preventral head contour about as steep, nearly straight or gently arched. Snout shape varying, from rounded to nearly pointed, profiles about equal or dorsal steeper, arched or straight. Orbit tangential or subtangential. Tip of maxilla exposed, to anterior margin of orbit or slightly behind.”

“Predorsal scales cycloid, laterally to line between dorsal fin origin and dorsal tip of preoperculum vertical limb, or margin of orbit superoposteriorly. Posterior cheek and dorsal opercular scales ctenoid.”

“Colouration: Yellowish to brownish yellow, with brown markings. Not conspicuously countershaded [sic], but paler ventrally; no pattern of dark scale-edges.”

“Juvenile (about 12—15 mm SL) pattern somewhat subdued. Bars rather broad, to ventral body edge, not forming spots on back. There is a lateral spot, and may be present also a spot in Bar 2. The lateral band is expressed chiefly where crossing the bars. Head stripes all present and well-developed. No caudal or pectoral spot, or midventral stripe. Two stripes of dots from each edge of the base of the pectoral axilla to caudal peduncle. Fins colourless, except dark anterior dorsal membranes and a black line along dorsal fin base.”

“Larger specimens lose the bars on the flanks, and the nape and back close to dorsal fin becomes more or less uniformly dark with sharp lower limit.”

“Dorsal fin in males dusky, basally dark, edge white, soft part darker, 0 (—3) terminal spot-stripes. In females dark close to base, rest dusky to almost colourless, lappets basally dark, distally colourless. Anterior two membranes dark in both sexes. Anal fin whitish or clear, with broad dark seam, more intensely pigmented in males. Ventral fin in males white; in females also, but not always, a black spot near base, or first ray and membrane black. Caudal fin in males from about 22mm SL: The lateral band continues along the middle portion, narrowing to tip, darker than on body. The edge formed by the ray tips has a broad dark seam. Generally the rest of the fin is colourless, whitish or yellowish, but, especially in younger males, an oblique intermediate band or traces of spotting may be present. Caudal fin in females more or less colourless to whitish, band continued on scaled part or little farther, not always spotted along middle for about 2/3 of fin length (3—4 indistinct cross-stripes), margin usually with narrow dark seam. Young males like females.”

Biology

From Froese and Pauly (2020):

Produces up to 150 eggs. Eggs are attached to the ceiling of caves, female cares for eggs and larvae. [Riehl and Baensch 1991].”

From Estivals et al. (2020):

“They can be found throughout the floodplain of the Amazon basin and live in all types of water, whether white, clear, or black (Kullander, 1986; Römer, 2006). The species prefers areas with minimal current where plant debris accumulates, particularly dead leaves (Römer, 2000).”

From Kullander (1980):

“Knöppel (1970) examined the stomach contents of 12 specimens from Lago Calado, a várzea lake near Manacapuru [Brazil] (fish from clear water). He found Hydracarina, insect larvae, copepods, and fruits, but predominantly plant matter and detritus.”

Human Uses

From Froese and Pauly (2020):

“Aquarium: commercial”

From de Oliveira et al. (2017):

“The Middle Solimões region stands out for the exploration of ornamental fish exported through the city of Manaus [Brazil]. Export records [from] this region indicate that [...] and species of the genus *Apistogramma* are the most commonly traded (Mendonça & Camargo, 2006).”

From Kullander (1980):

“*A. agassizii* was imported to Germany as aquarium fish already in 1909 (Holly et al.: 76/77) [...]”

Diseases

No records of OIE reportable diseases were found (OIE 2020) for *Apistogramma agassizii*.

From Froese and Pauly (2020):

“White spot Disease, Parasitic infestations (protozoa, worms, etc.)
Costia Disease, Parasitic infestations (protozoa, worms, etc.)
Turbidity of the Skin (Freshwater fish), Parasitic infestations (protozoa, worms, etc.)
Bacterial Infections (general), Bacterial diseases
Cestoda infestation, Parasitic infestations (protozoa, worms, etc.)
Ichthyobodo Infection, Parasitic infestations (protozoa, worms, etc.)
Metacercaria Infection (Flatworms), Parasitic infestations (protozoa, worms, etc.)”

Threat to Humans

From Froese and Pauly (2020):

“Harmless”

3 Impacts of Introductions

No records of introductions were found for *Apistogramma agassizii*; therefore, there is no information on impacts of introduction.

A. agassizii is regulated in Hawaii.

4 History of Invasiveness

Apistogramma agassizii has been in trade as an ornamental fish since at least 1909 (Kullander 1980). However, there are no records quantifying the number of individuals traded, nor any records of introductions. Thus, the history of invasiveness is classified as No Known Nonnative Populations.

5 Global Distribution

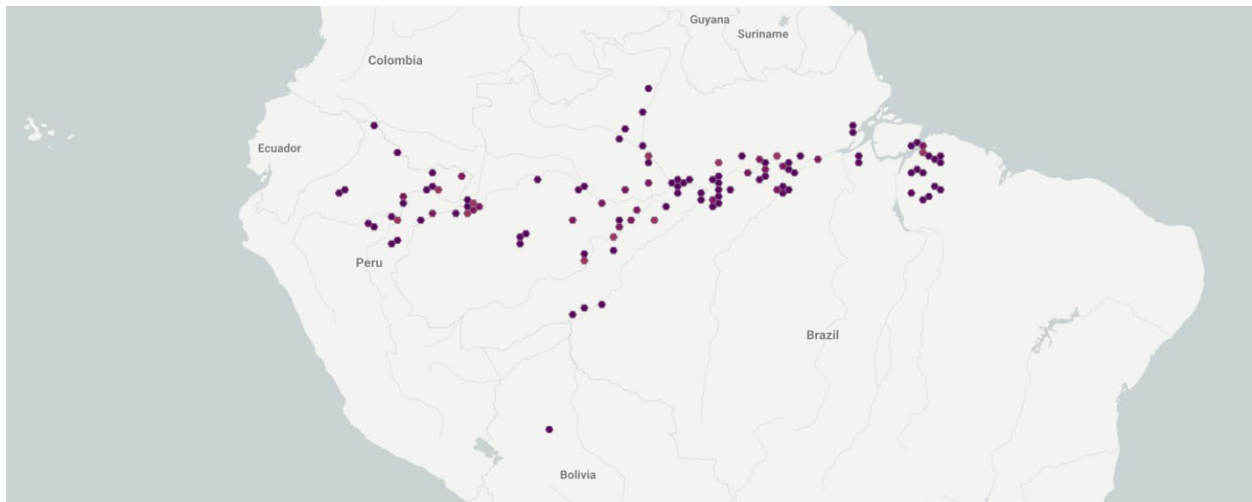


Figure 1. Known global distribution of *Apistogramma agassizii*. Observations are reported from Brazil, Colombia, Peru, and Bolivia. Map from GBIF Secretariat (2020).

6 Distribution Within the United States

No records of *Apistogramma agassizii* in the wild in the United States were found.

7 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Apistogramma agassizii* was low for virtually all of the contiguous United States. There was a small area of high match in southeastern Florida. The overall Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.004, low (scores between 0.000 and 0.005, inclusive, are classified as low). Only Florida had a high individual Climate 6 score, all other States had low individual Climate 6 scores.

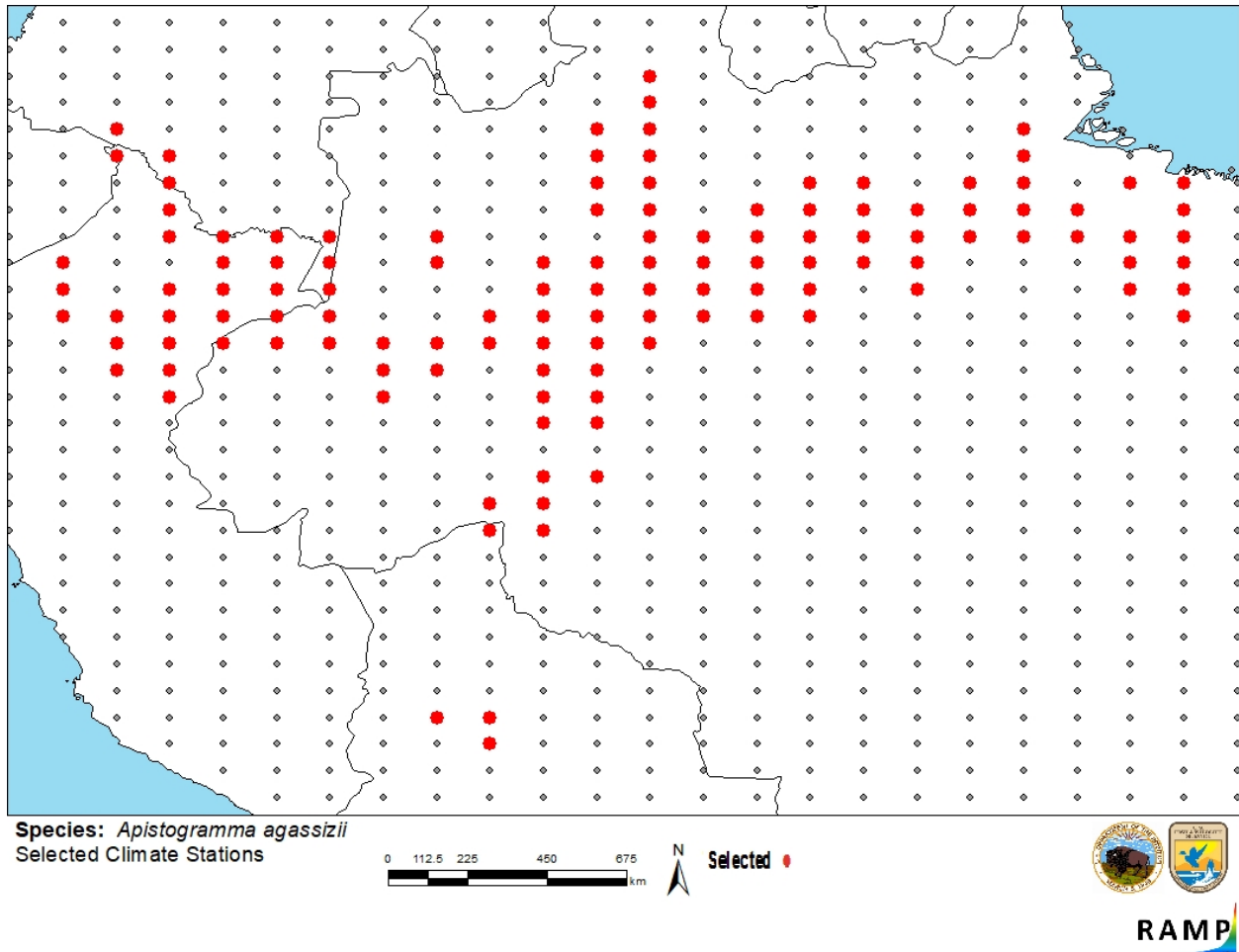


Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in northern South America selected as source locations (red; Brazil, Colombia, Peru, and Bolivia) and non-source locations (gray) for *Apistogramma agassizii* climate matching. Source locations from GBIF Secretariat (2020). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

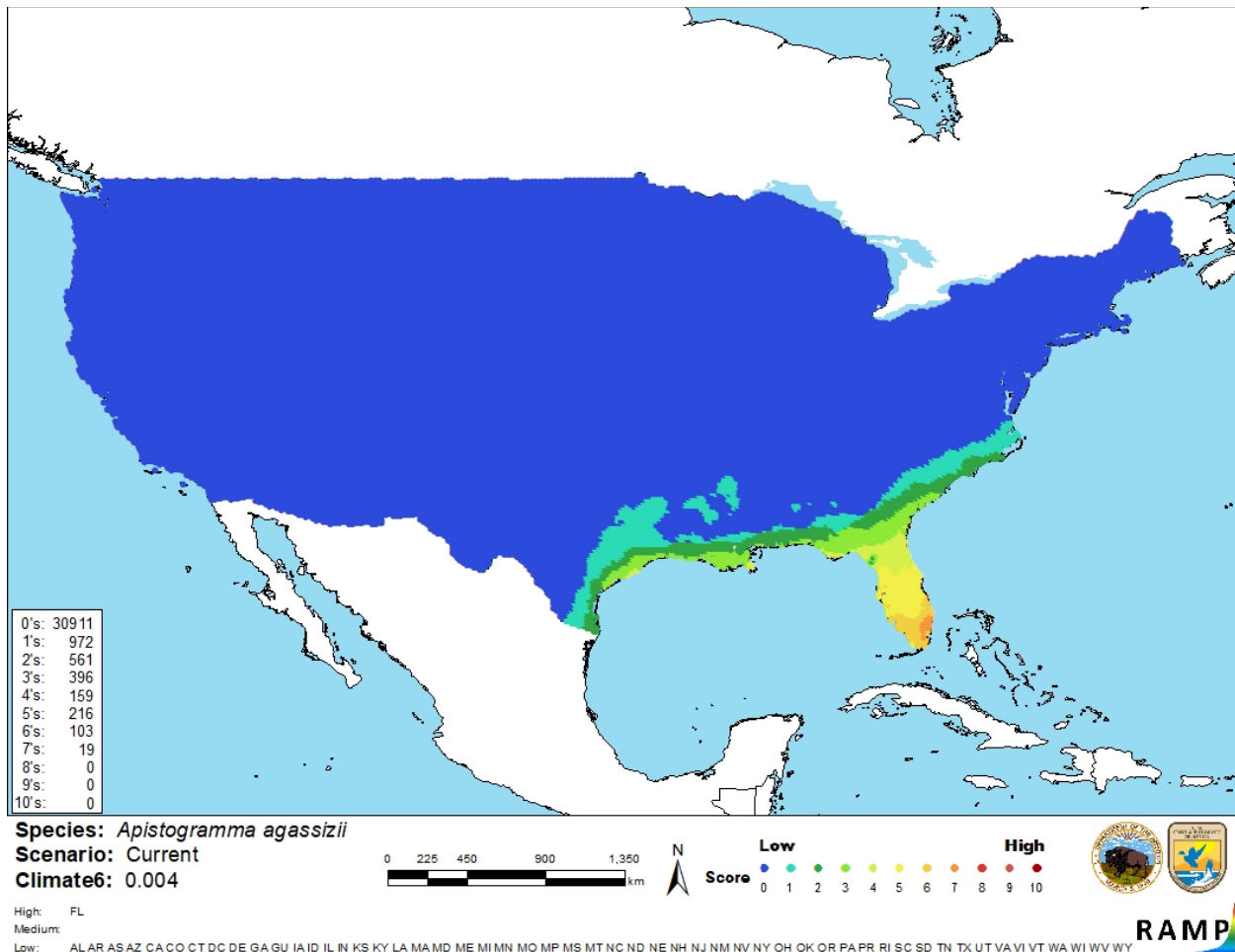


Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *Apistogramma agassizii* in the contiguous United States based on source locations reported by GBIF Secretariat (2020). Counts of climate match scores are tabulated on the left. 0/Blue = Lowest match, 10/Red = Highest match.

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

The certainty of assessment for *Apistogramma agassizii* is low. Biological and ecological information for this species was available but limited. Although this species is in trade as an aquarium fish no records of introduction were found, thus impacts of introduction are unknown.

Additionally, results from Estivals et al. (2020) indicate that *A. agassizii* may represent a complex of several undescribed distinct species.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Agassiz's Dwarf Cichlid (*Apistogramma agassizii*) is a South American freshwater fish native to parts of the Amazon River basin in Brazil, Colombia, Peru, and Bolivia. It is a popular ornamental species available in the United States and elsewhere but no trade history or any records of introductions were found. *A. agassizii* is regulated in Hawaii. Thus, the history of invasiveness is classified as No Known Nonnative Populations. The overall climate match for the contiguous United States was Low with all States having low individual Climate 6 scores with the exception of Florida, which had a high individual Climate 6 score. The certainty of assessment is Low due to a lack of information and potential taxonomic uncertainty. The overall risk assessment category is Uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 4): No Known Nonnative Population**
- **Overall Climate Match Category (Sec. 7): Low**
- **Certainty of Assessment (Sec. 8): Low**
- **Remarks, Important additional information:** Potential taxonomic uncertainty; *Apistogramma agassizii* may represent a complex of several undescribed distinct species (Estivals et al. 2020).
- **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.

Aqua Imports. 2020. Double red Agassizi dwarf cichlid (*Apistogramma agassizi* 'double red'). Available: <https://www.aqua-imports.com/product/double-full-red-agassizi-pair-apistogramma-agassizi/> (November 2020).

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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.

- Britzke R. 2015. Relações filogenéticas do gênero *Apistogramma* (Teleostei, Cichlidae) e filogeografia da espécie *Apistogramma agassizii*. Doctoral dissertation. Botucatu, Brazil: Universidade Estadual Paulista Júlio de Mesquita Filho, Instituto de Biociências de Botucatu.
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