Jewel Tetra (*Hyphessobrycon eques*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, February 2011
Revised, February 2019
Web Version, 10/10/2019

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1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2019):

"South America: Amazon, Guaporé and Paraguay River basins [Argentina, Brazil, Paraguay, Uruguay]."

"Known from upper Paraná [López et al. 2005] and Corrientes [López et al. 2003] [in Argentina]."

"Recorded from Concepcion [in Paraguay]."

Status in the United States

According to Nico (2019), *Hyphessobrycon eques* was recorded in a canal at the upper end of Mill Bayou, Bay County [Florida] in 1989.

From Nico (2019):

"Failed in Florida"

From Froese and Pauly (2019):

"A popular aquarium fish, found in 65% of pet shops near Lakes Erie and Ontario [Rixon et al. 2005]. The only record is that of two specimens taken in Florida from a canal at the upper end of Mill Bayou, Bay County, in September 1989."

Means of Introductions in the United States

From Froese and Pauly (2019):

"These fish were either aquarium releases or fish that escaped from a fish farm [Bartley 2006]."

Remarks

No additional remarks.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From Fricke et al. (2019):

"**Current status:** Valid as *Hyphessobrycon eques* (Steindachner 1882)."

From ITIS (2019):

"Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Actinopterygii
Class Teleostei
Superorder Ostariophysi
Order Characiformes

Family Characidae
Genus *Hyphessobrycon*
Species *Hyphessobrycon eques* (Steindachner, 1882)"

Size, Weight, and Age Range

From Froese and Pauly (2019):

"Maturity: L_m 2.1 range ? - ? cm
Max length : 4.0 cm SL male/unsexed; [Britski et al. 2007]"

Environment

From Froese and Pauly (2019):

"Freshwater; benthopelagic; pH range: 5.0 - 7.8; dH range: 10 - 25. […]; 22°C - 26°C [assumed to be the recommended aquarium temperature] [Baensch and Riehl 1991]"

Climate/Range

From Froese and Pauly (2019):

"Tropical; […]"

Distribution Outside the United States

Native

From Froese and Pauly (2019):

"South America: Amazon, Guaporé and Paraguay River basins [Argentina, Brazil, Paraguay, Uruguay]."

"Known from upper Paraná [López et al. 2005] and Corrientes [López et al. 2003] [in Argentina]."

"Recorded from Concepcion [in Paraguay]."

Introduced

According to Froese and Pauly (2019) *Hyphessobrycon eques* is introduced in French Guiana, Philippines, Spain, and Canada. The species' status is unknown in Canada, Spain, and Philippines, and listed as probably established in French Guiana.

From Froese and Pauly (2019):

"Known only in Lac des Américains near Rochambeau [French Guiana] which is outside its area of distribution. It is most probably an introduced species."

"Introduced [to the Philippines] in the 1970's."

Means of Introduction Outside the United States
From Froese and Pauly (2019):

“ornamental”

Short Description
No short description of *Hyphessobrycon eques* was available.

Biology
From Froese and Pauly (2019):

“A gregarious species which positions itself near the surface between the stems of emerging plants. It is frequently found in stagnant waters. They are generally peaceful, but when there are too many of them during feeding, they bite each other's fins [Planquette et al.1996]. Feeds on worms, crustaceans, insects and plants [Mills and Vevers 1989]. Oviparous [Breder and Rosen 1966]. This species is part of a complex of `blood' tetras, hybrids of which are commonly offered in the aquarium trade. Aquarium keeping: aggressive; in groups of 5 or more individuals; minimum aquarium size 60 cm [BMELF 1999].”

“Oviparous [Breder and Rose 1966]. In captivity, spawning is preceded by vigorous driving by the male during the early hours of the day and eggs mostly sink to the bottom [Mills and Vevers 1989].”

Human Uses
From Froese and Pauly (2019):

“Aquarium: highly commercial”

“A popular aquarium fish, found in 65% of pet shops near Lakes Erie and Ontario [Rixon et al. 2005].”

“One of the most frequently found species in the pet and aquarium stores [in Spain] [Maceda-Viega et al. 2013].”

Diseases
From Froese and Pauly (2019):

“White spot Disease, Parasitic infestations (protozoa, worms, etc.)
Bacterial Infections (general), Bacterial diseases”

From Acosta and Silva (2015):

“This study reports for the first time infection with *Hysterothylacium* sp. larvae in the ornamental fish *Hyphessobrycon eques* from the Paranapanema River, Jurumirim Reservoir, São Paulo State, Brazil.”

No OIE reportable diseases (OIE 2019) were found for *Hyphessobrycon eques*.

Threat to Humans

From Froese and Pauly (2019):

“Harmless”

3 Impacts of Introductions

From Froese and Pauly (2019):

“The introduction of this species by aquarists thus endangered the local species which occupy similar ecological niches [Planquette et al. 1996].”

4 Global Distribution

Figure 1. Known global distribution of *Hyphessobrycon eques*. Locations are in Peru, Argentina, French Guiana, Brazil, Colombia, Bolivia, Venezuela, and Paraguay. Map from GBIF Secretariat (2019).

5 Distribution Within the United States

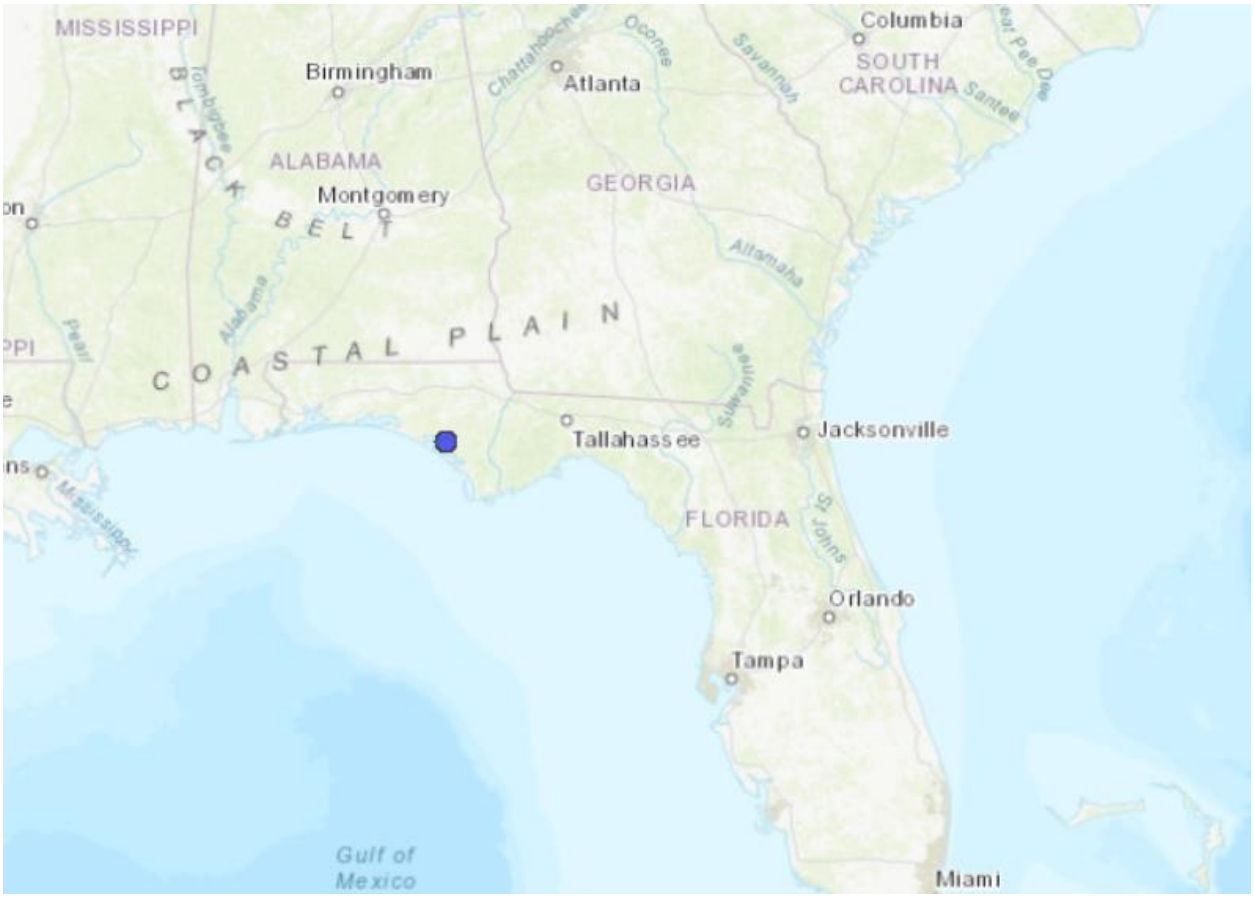

Figure 2. Known distribution of *Hyphessobrycon eques* in the United States. Map from BISON (2019). The location in Florida was not used to select source points for the climate match, the introduction did not result in an established population.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Hyphessobrycon eques* was medium for most of the contiguous United States. There were areas of medium or high matches throughout the Gulf Coast and up the East coast. The northern border and parts of the Midwest had lower climate matches. The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.054, medium (scores greater than 0.005, but less than 0.103, are classified as medium). All States having low individual Climate 6 scores, except Alabama and Missouri, which had medium scores, and Florida, Georgia, Louisiana, North Carolina, South Carolina, and Texas, which had high scores.

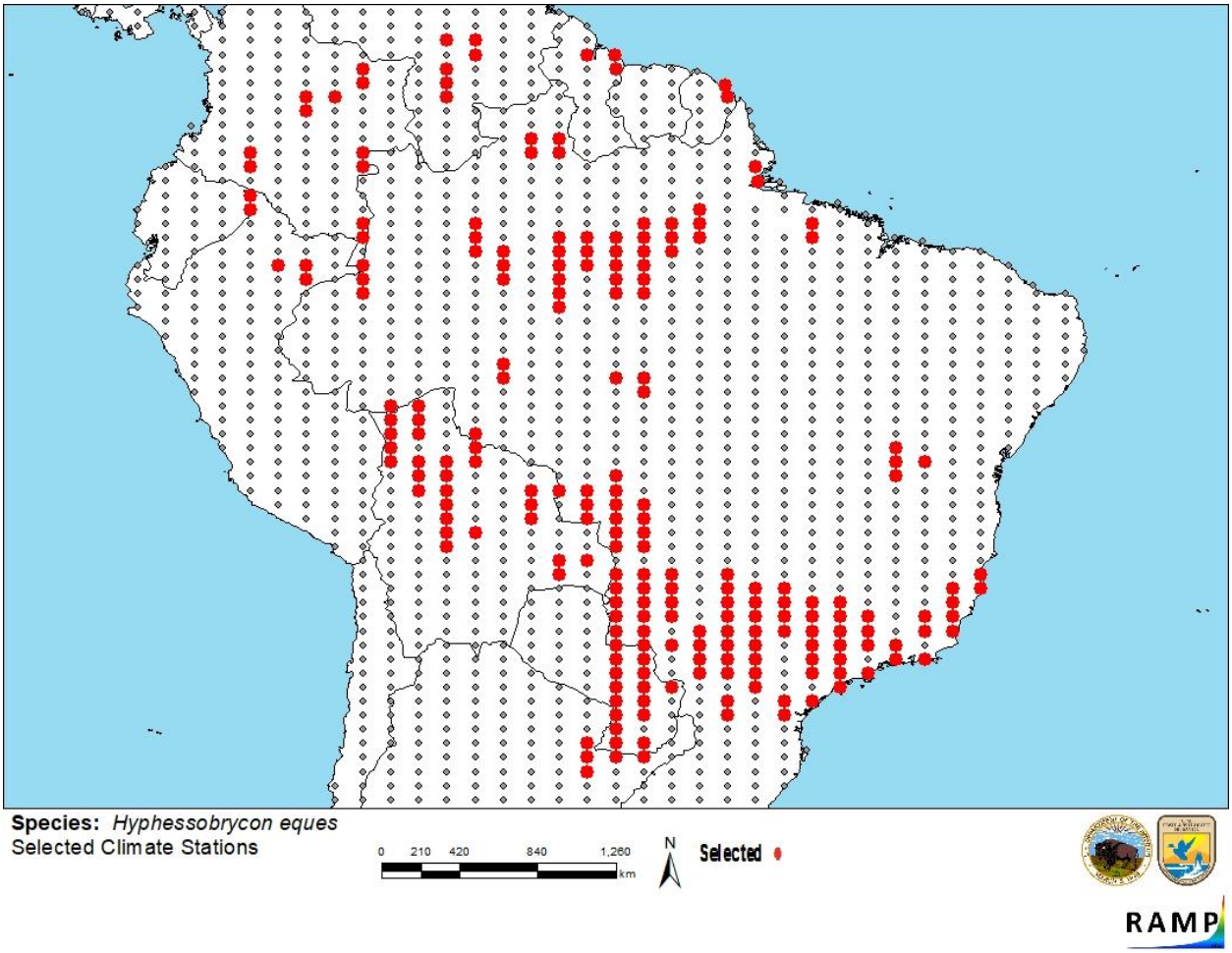

Figure 3. RAMP (Sanders et al. 2018) source map showing weather stations in South America selected as source locations (red; Venezuela, Colombia, Ecuador, Peru, Brazil, Guyana, French Guiana, Bolivia, Paraguay, Argentina) and non-source locations (gray) for *Hyphessobrycon eques* climate matching. Source locations from GBIF Secretariat (2019). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

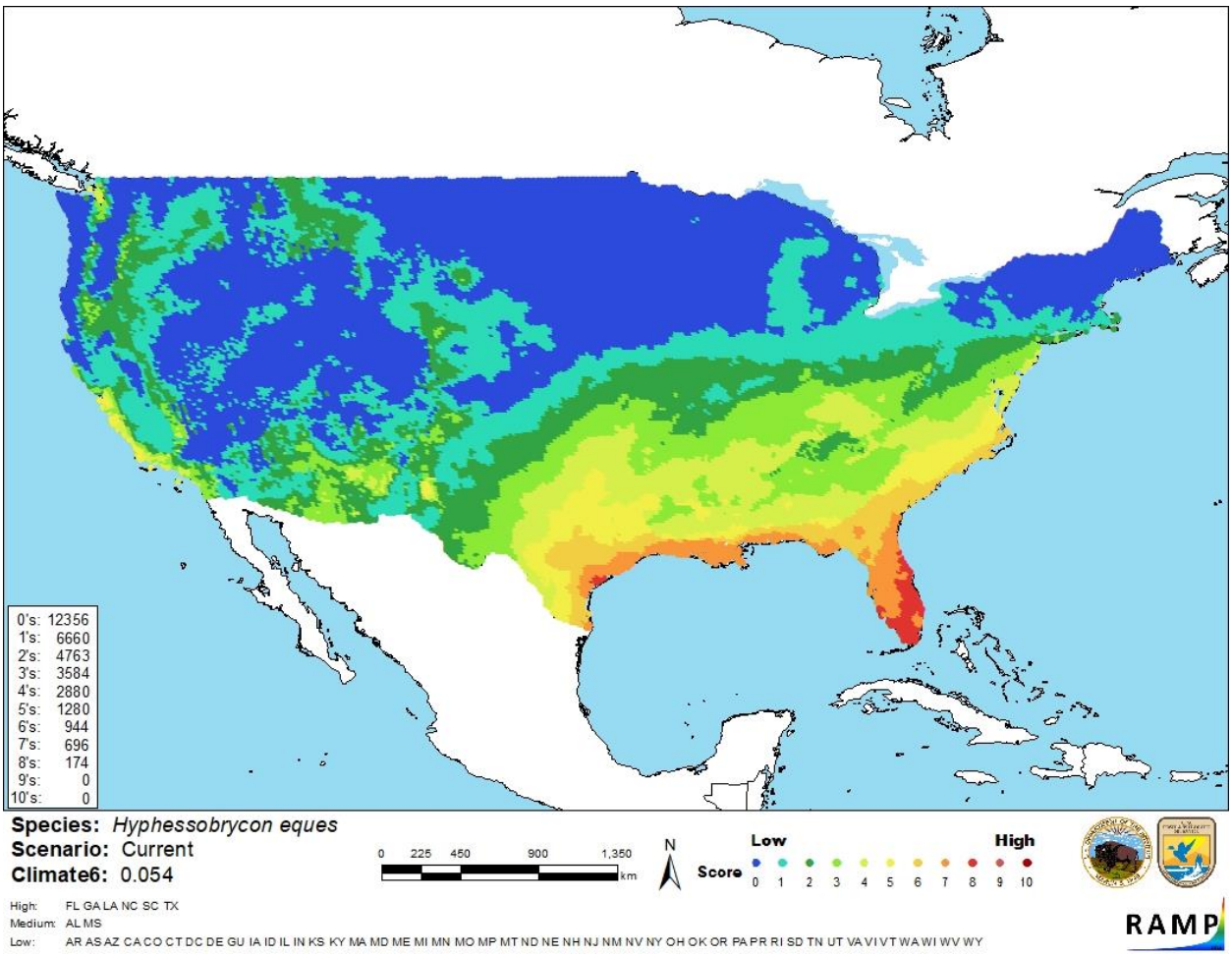

Figure 4. Map of RAMP (Sanders et al. 2018) climate matches for *Hyphessobrycon eques* in the contiguous United States based on source locations reported by GBIF Secretariat (2019). 0 = Lowest match, 10 = Highest match.

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

The certainty of assessment for *Hyphessobrycon eques* is low. There is minimal information available for this species. Although there was some information available on introductions of *H. eques*, there was no information for the impacts of introduction.

8 Risk Assessment

Summary of Risk to the Contiguous United States

The Jewel Tetra (*Hyphessobrycon eques*) is a fish found throughout South America. The history of invasiveness is None Documented. The species is established in French Guiana, but the impacts of its introduction are not known. *Hyphessobrycon eques* has a documented introduction in Florida, believed to be from an aquarium release, and the fish failed to establish. The climate match for the contiguous United States was medium. There were areas of medium or high matches throughout the Gulf Coast and up the East Coast. *Hyphessobrycon eques* is found readily in the aquarium trade. 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): Medium**
- **Certainty of Assessment (Sec. 7): Low**
- **Remarks/Important additional information:** Introduced but failed to establish in Florida.
- **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.

Acosta A. A., and D. J. Silva. 2015. First record of *Hysterothylacium* sp. Moravec, Kohn et Fernandes, 1993 larvae (Nematoda: Anisakidae) infecting the ornamental fish *Hyphessobrycon eques* Steindachner, 1882 (Characiformes, Characidae). Brazilian Journal of Biology 75(3):638–642.

BISON. 2019. Biodiversity Information Serving Our Nation (BISON). U.S. Geological Survey. Available: https://bison.usgs.gov. (February 2019).

Fricke, R., W. N. Eschmeyer, and R. van der Laan, editors. 2019. Eschmeyers' catalog of fishes: genera, species, references. Available: http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp. (February 2019).

Froese, R., and D. Pauly, editors. 2019. *Hyphessobrycon eques* (Steindachner, 1882). FishBase. Available: https://www.fishbase.de/summary/Hyphessobrycon-eques.html. (February 2019).

GBIF Secretariat. 2019. GBIF backbone taxonomy: *Hyphessobrycon eques* (Steindachner, 1882). Global Biodiversity Information Facility, Copenhagen. Available: https://www.gbif.org/species/2354612. (February 2019).

ITIS (Integrated Taxonomic Information System). 2019. *Hyphessobrycon eques* (Steindachner, 1882) Integrated Taxonomic Information System, Reston, Virginia. Available: https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=639869#null. (February 2019).

Nico, L. 2019. *Hyphessobrycon eques*. U.S. Geological Survey, Nonindigenous Aquatic Species Database, Gainesville, Florida. Available: http://nas.er.usgs.gov/queries/FactSheet.aspx?speciesID=422. (February 2019)

OIE (World Organisation for Animal Health). 2019. OIE-listed diseases, infections and infestations in force in 2019. Available: http://www.oie.int/animal-health-in-the-world/oie-listed-diseases-2019/. (October 2019).

Sanders, S., C. Castiglione, and M. Hoff. 2018. Risk assessment mapping program: RAMP, version 3.1. U.S. Fish and Wildlife Service.

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.

Baensch, H. A., and R. Riehl. 1995. Aquarien atlas, band 4. Mergus Verlag GmbH, Verlag für Natur-und Heimtierkunde, Melle, Germany.

Bartley, D. M., editor. 2006. Introduced species in fisheries and aquaculture: information for responsible use and control. CD-ROM. Rome, FAO.

BMELF (Bundesministerium für Ernährung, Landwirtschaft und Forsten). 1999. Gutachten über Mindestanforderungen an die Haltung von Zierfischen (Süßwasser). Bundesministerium für Ernährung, Landwirtschaft und Forsten, Bonn, Germany.

Breder, C. M., and D. E. Rosen. 1966. Modes of reproduction in fishes. T.F.H. Publications, Neptune City, New Jersey.

Britski, H. A., K. Z. de S. de Silimon, and B. S. Lopes. 2007. Peixes do Pantanal: manual de identificaçäo, 2 ed. re. ampl. Embrapa Informaçäo Tecnológica, Brasília, DF.

López, H. L., A. M. Miquelarena, and R. C. Menni. 2003. Lista comentada de los peces continentales de la Argentina. ProBiota Serie Técnica y Didáctica 5.

López, H. L., A. M. Miquelarena, and J. Ponte Gómez. 2005. Biodiversidad y distribución de la ictiofauna Mesopotámica. Miscelánea 14:311–354.

Maceda-Veiga, A., A. de Sostoa, A. Escribano-Alacid, and E. García-Berthou. 2013. The aquarium trade as a potential source of fish introductions in southwestern Europe. Biological Invasions 15:2707–2716.

Mills, D., and G. Vevers. 1989. The Tetra encyclopedia of freshwater tropical aquarium fishes. Tetra Press, New Jersey.

Planquette, P., P. Keith, and P.-Y. Le Bail. 1996. Atlas des poissons d'eau douce de Guyane. Tome 1. Collection du Patrimoine Naturel volume 22, MNHN and INRA, Paris.

Rixon, C. A. M., I. C. Duggan, N. M. N. Bergeron, A. Ricciardi, and H. J. Macisaac. 2005. Invasion risks posed by the aquarium trade and live fish markets on the Laurentian Great Lakes. Biodiversity and Conservation 14:1365–1381.

Steindachner, F. 1882. Beiträge zur Kenntniss der Flussfische Südamerika's (IV). Anzeiger der Kaiserlichen Akademie der Wissenschaften in Wien, Mathematisch-Naturwissenschaftlichen Klasse 19(19):175–180.