Glowlight Tetra (*Hemigrammus erythrozonus*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, January 2016
Revised, March 2018
Web Version, 7/30/2018

Photo: G. Valenzuela. Licensed under Creative Commons (CC-BY-2.0). Available: https://commons.wikimedia.org/wiki/File:Tetra_Glowlight_cropped.jpg. (March 2018).

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2018):

"South America: Essequibo River."

From Eschmeyer et al. (2018):

"Essequibo River, Guyana."

Status in the United States

This species has not been reported as introduced or established in the United States. Rixon et al. (2005) note *H. erythrozonus* is available for trade within the United States and Canada as part of the ornamental fish industry.

Means of Introductions in the United States

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

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 *Hemigrammus*
Species *Hemigrammus erythrozonus* Durbin, 1909"

"Current Standing: valid"

Size, Weight, and Age Range

Eigenmann (1917) lists the size range of specimens as 21-33mm.

From Froese and Pauly (2018):

"Maximum length questionable [Lima et al 2003]. Maximum length reported to reach 4 cm TL [Mills and Vevers 1989]."

Environment

From Froese and Pauly (2018):

"Freshwater; benthopelagic; pH range: 6.0 - 8.0; dH range: 5 - 12."

Climate/Range
From Froese and Pauly (2018):

"Tropical; 24°C - 28°C [Riehl and Baensch; assumed to represent recommended aquarium water temperature]"

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

"South America: Essequibo River."

From Eschmeyer et al. (2018):

"Essequibo River, Guyana."

Introduced
This species has not been reported introduced beyond its native range.

Means of Introduction Outside the United States
This species has not been reported introduced beyond its native range.

Short Description
From Eigenmann (1917):

"No true humeral spot; pores and margins of the first three or four scales in the lateral line heavily outlined with dusky [*sic*] and a group of large chromatophores just behind the eye on the head give the appearance of a humeral spot. Web of distal half of dorsal, almost all of the caudal, all of the ventrals, pectorals, and the web between the first and seven anal rays dusky. Often a faint little dark spot at the base of each caudal lobe, not true caudal spot. A broad stripe without chromatophores cherry-red in life extends from the head to the caudal and halfway to the end of the middle caudal rays. Below this lateral stripe a dusky stripe with two scales in width extends the length of the body. The belly and a streak on the sides, from just above the base of the anterior ten anal rays to the mandible, without chromatophores. Bases of the anal and under side of the caudal peduncle black to dusky. Lips dusky. Dorsal lobe and upper part of the iris cherry-red in life."

Biology
From Froese and Pauly (2016):

"Feeds on worms, small crustaceans and plants [Mills and Vevers 1989]."

Human Uses
From Froese and Pauly (2018):

"Aquarium: highly commercial"

"A popular aquarium fish [Gery 1977]."

Rixon et al. (2005) note *H. erythrozonus* is available for trade within the United States and Canada as part of the ornamental fish industry.

Diseases
From Froese and Pauly (2018):

"Fin-rot Disease (late stage), Bacterial diseases
White spot Disease, Parasitic infestations (protozoa, worms, etc.)
Fin Rot (early stage), Bacterial diseases
Bacterial Infections (general), Bacterial diseases"

No OIE listed diseases were reported.

Threat to Humans
From Froese and Pauly (2018):

"Harmless"

3 Impacts of Introductions
This species has not been reported beyond its native range.

4 Global Distribution

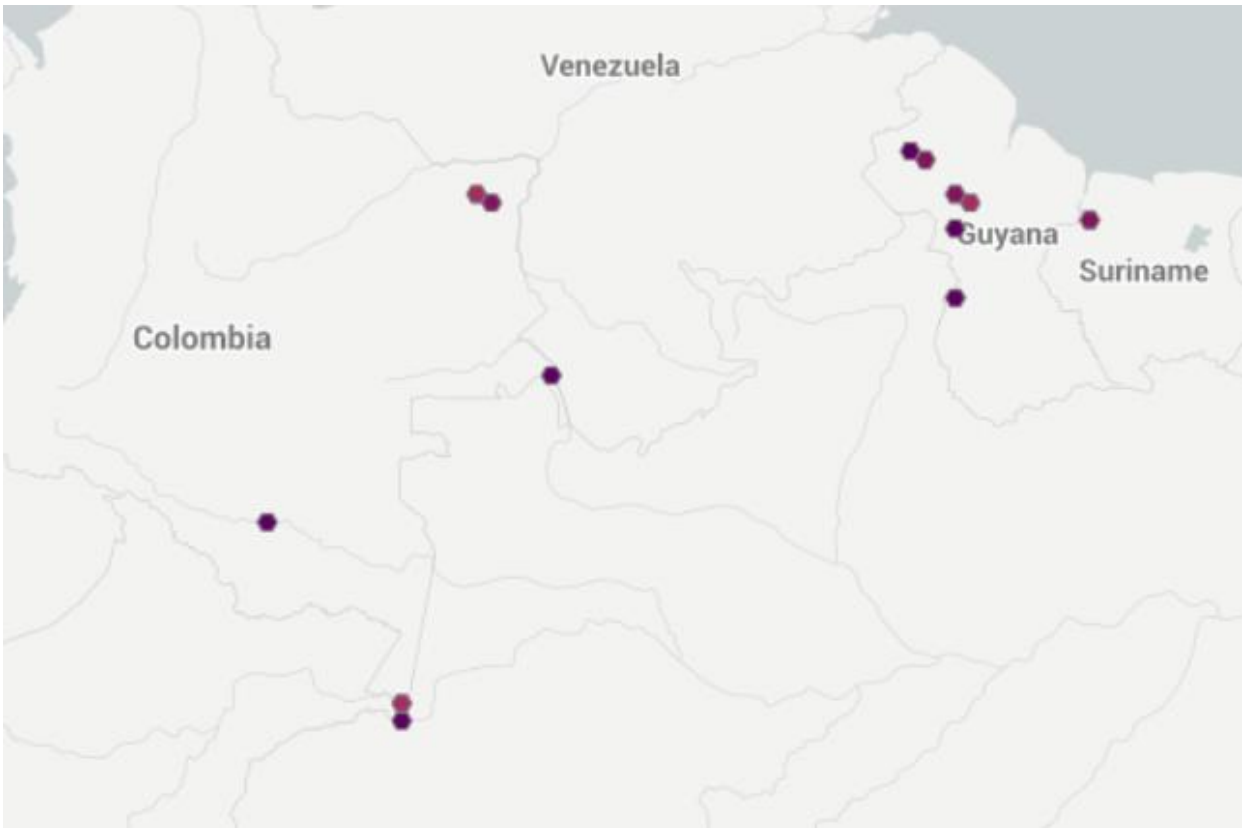

Figure 1. Known global distribution of *Hemigrammus erythrozonus*, reported from northern South America. Map from GBIF Secretariat (2017). Only occurrences within Guyana represent known established populations (Eschmeyer et al. 2018), so only those occurrences were used in the climate matching analysis.

5 Distribution Within the United States

This species has not been reported within the United States.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2018; 16 climate variables; Euclidean Distance) for *Hemigrammus erythrozonus* within the contiguous United States is low overall. The Climate6 proportion for this species is 0.000. The range of proportions classified as low match is 0.000 to 0.005, inclusive. Locally, all states within the country had a low overall climate match. There was an area of medium match in Southeast Florida and far southern Louisiana.

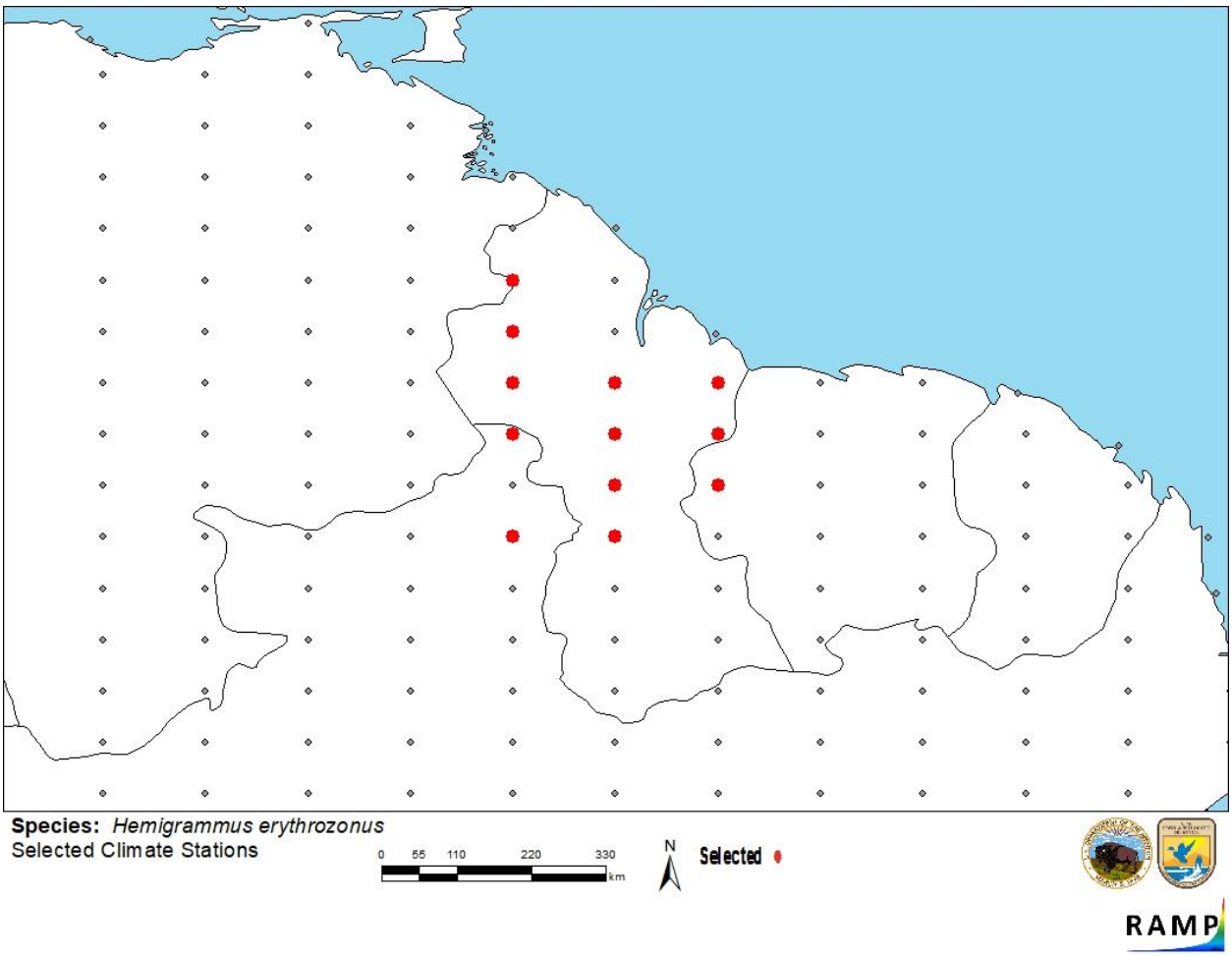

Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in northeastern South America selected as source locations (red; Guyana, Brazil, Suriname) and non-source locations (gray) for *Hemigrammus erythrozonus* climate matching. Source locations from GBIF Secretariat (2017). Selected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

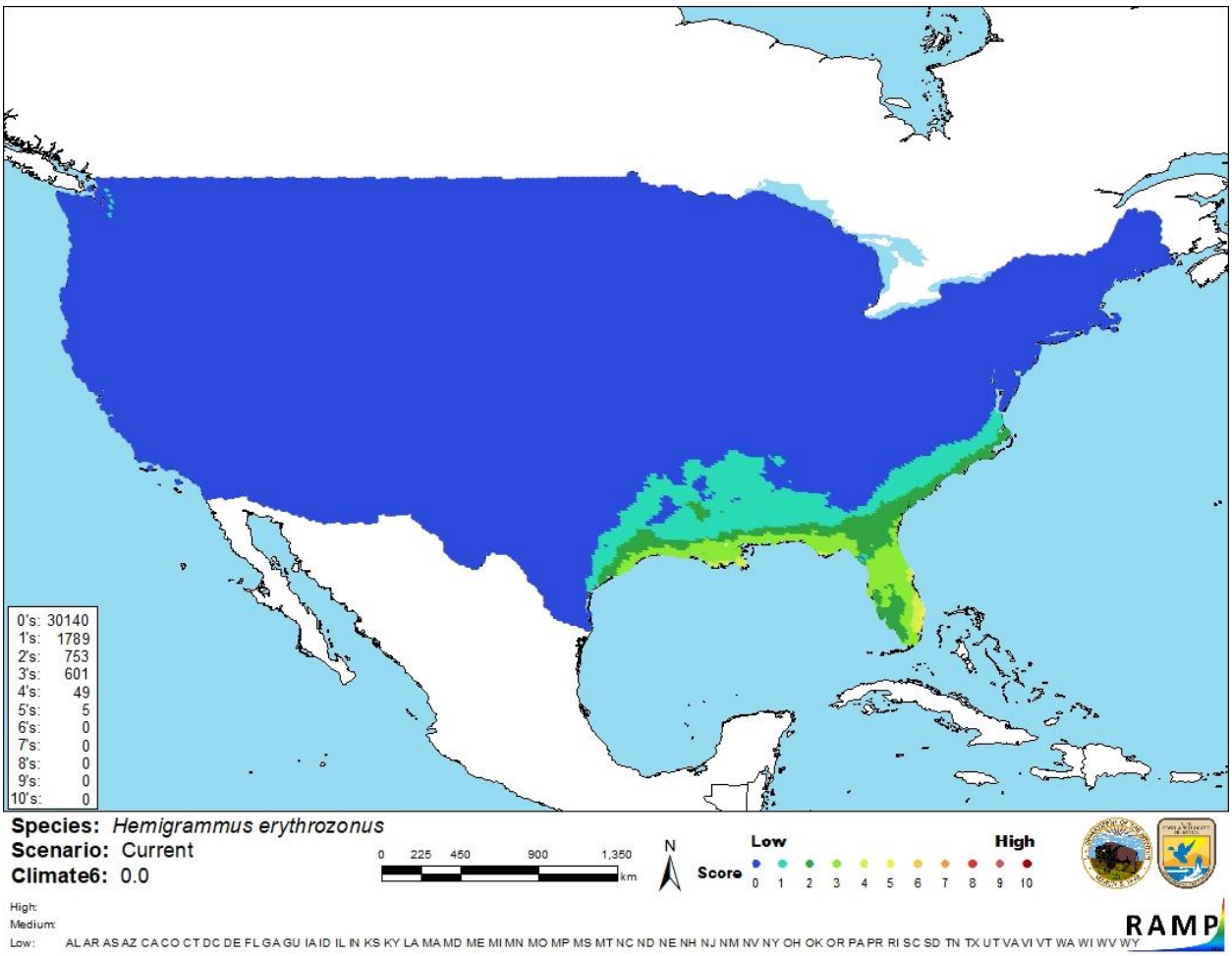

Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *Hemigrammus erythrozonus* in the contiguous United States based on source locations reported by GBIF Secretariat (2017). 0=Lowest match, 10=Highest match.

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

Information on the biology and ecology of *Hemigrammus erythrozonus* is available, although not in great quantity. No introductions of this species have been reported, so impacts of introduction are unknown. Certainty of assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Glowlight Tetra (*Hemigrammus erythrozonus*) is a fish native to the Essequibo River basin in South America. It is susceptible to several bacterial infections and parasites. Some information about the species is available for review, although it is limited in quantity and scope. Most of the existing information focuses on the species' biology and its use as a popular aquarium fish. There are no reports of introductions of *H. erythrozonus* beyond its native range, therefore there is uncertainty about its ability to establish in nonnative settings. Certainty of assessment is low. *H. erythrozonus* is currently available within the contiguous United States as an ornamental fish, but the climate match is low overall. Further, all states demonstrated low matches overall. There are areas of medium match in southeastern Florida and far southern Louisiana. Given the limited scope of existing information, the species uncertain history of invasiveness, and low climate match, overall risk for *Hemigrammus erythrozonus* 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.

Eigenmann, C. E. 1917. The American Characidae. Memoirs of the Museum of Comparative Zoology at Harvard College, Cambridge, Massachusetts.

Froese, R., and D. Pauly, editors. 2018. *Hemigrammus erythrozonus* Durbin, 1909. FishBase. Available: http://www.fishbase.us/summary/SpeciesSummary.php?ID=10642&genusname=Hemigrammus&speciesname=erythrozonus&AT=Hemigrammus+erythrozonus. (March 2018).

GBIF Secretariat. 2018. GBIF backbone taxonomy *Hemigrammus erythrozonus* Durbin, 1909. Global Biodiversity Information Facility, Copenhagen. Available: https://www.gbif.org/species/9537715. (March 2018, July 2018).

ITIS (Integrated Taxonomic Information System). 2018. *Hemigrammus erythrozonus* Durbin, 1909. Integrated Taxonomic Information System, Reston, Virginia. Available: https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=162978#null. (March 2018).

Rixon, C. A., I. C. Duggan, N. M. 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(6):1365-1381.

Sanders, S., C. Castiglione, and M. H. 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.

Gery, J. 1977. Characoids of the world. T. F. H. Publications, Neptune City, New Jersey.

Lima, F. C. T., L. R. Malabarba, P. A. Buckup, J. F. Pezzi da Silva, R. P. Vari, A. Harold, R. Benine, O. T. Oyakawa, C. S. Pavanelli, N. A. Menezes, C. A. S. Lucena, M. C. S. L. Malabarba, Z. M. S. Lucena, R. E. Reis, F. Langeani, C. Moreira et al. 2003. Genera incertae sedis in Characidae. Pages 106-168 *in* R. E. Reis, S. O. Kullander, and C. J. Ferraris, Jr., editors. Checklist of the freshwater fishes of South and Central America. EDIPUCRS, Porto Alegre, Brazil.

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

Riehl, R., and H. A. Baensch. 1991. Aquarien Atlas, volume 1. Mergus, Verlag für Natur-und Heimtierkunde, Melle, Germany.