Head-and-taillight Tetra (*Hemigrammus ocellifer*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, February 2011
Revised, September 2018
Web Version, 2/15/2019

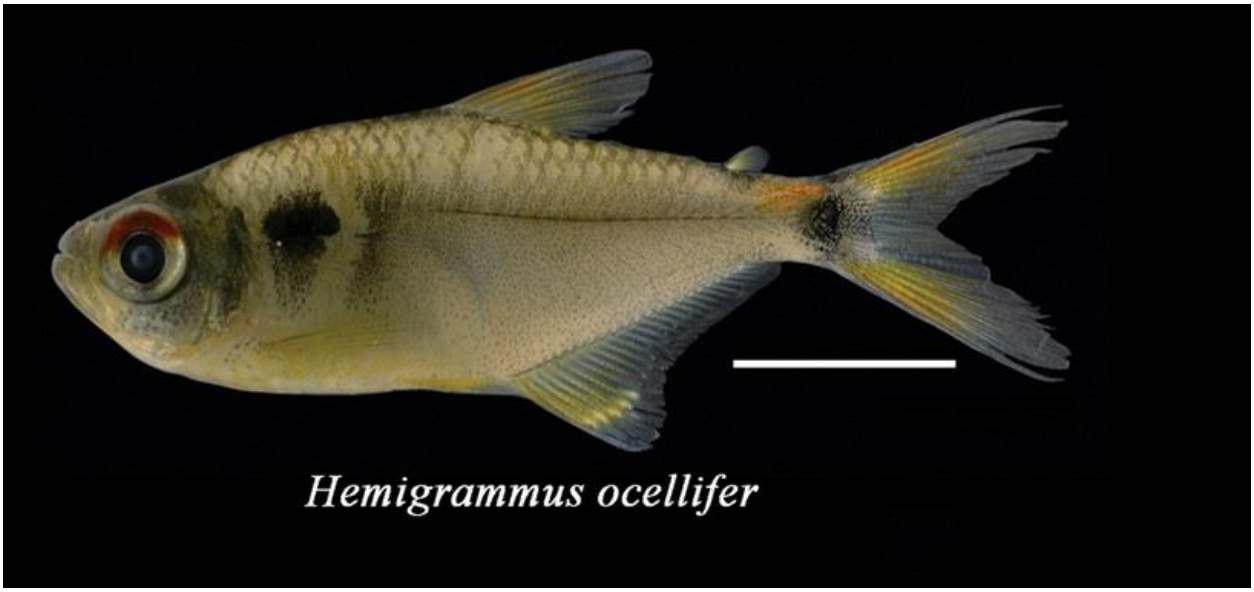

Photo: C. Silva-Oliveira, A. L. C. Canto, and F. R. V. Ribeiro. Licensed under CC BY 4.0. Available: https://commons.wikimedia.org/wiki/File:Hemigrammus_ocellifer,_Tapaj%C3%B3s.jpg. (September 2018).

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2018):

"South America: Rivers of Guyana, Suriname, French Guiana, and Amazon basin in Brazil and Peru."

From Nico (2018):

"Tropical America. The true *Hemigrammus ocellifer* is native to drainages in northeastern South America, including French Guiana, Guyana, and Venezuela (Géry 1977)."

From Fricke et al. (2018):

"Distribution: Amazon River basin: Ecuador, Guyana, Suriname, French Guiana, Peru, Bolivia, Colombia and Brazil."

Status in the United States

Nico (2018) reports *Hemigrammus ocellifer* from "San Luis Valley (Rio Grande headwaters drainage)" in Colorado in 1986. The status of the population is listed as "failed."

This species is in trade in the United States.

From That Fish Place (2018):

"Head & Tail Light Tetra - *Hemigrammus ocellifer* […] $1.99"

Means of Introductions in the United States

From Nico (2018):

"Records represent escapes from areas of the hot springs used for culturing ornamental fish."

"The hot springs area is located at an altitude of 8,000 ft and has very cold winters, but Zuckerman (personal communication) suggested that some of the introduced species have the potential to spread downstream and reach other thermal refugia during warmer months."

Remarks

Previously, *Hemigrammus ocellifer* was thought to have two subspecies: *H. o. ocellifer* and *H. o. falsus*. *Hemigrammus falsus* is now recognized as its own species.

From Frankel (2002):

"The beacon fish (*Hemigrammus ocellifer*) exhibits two phenotypes associated with spotting at the base of the caudal fin, with fish either possessing (*H. o. ocellifer*) or lacking (*H. o. falsus*) a prominent red spot in this region."

From Fricke et al. (2018):

"*falsus, Hemigrammus ocellifer* […] Current status: Valid as *Hemigrammus falsus* Meinken 1958. Characidae: Stethaprioninae."

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 ocellifer* (Steindachner, 1882)"

From Fricke et al. (2018):

"Current status: Valid as *Hemigrammus ocellifer* (Steindachner 1882). Characidae: Stethaprioninae."

Size, Weight, and Age Range

From Froese and Pauly (2018):

"Max length : 4.4 cm TL male/unsexed; [Lima et al. 2003]"

Environment

From Froese and Pauly (2018):

"Freshwater; benthopelagic; pH range: 6.0 - 8.0; dH range: 5 - 19. […] 22°C - 26°C [Riehl and Baensch 1991; assumed to be recommended aquarium temperature range]"

Climate/Range

From Froese and Pauly (2018):

"Tropical; […]"

Distribution Outside the United States

Native

From Froese and Pauly (2018):

"South America: Rivers of Guyana, Suriname, French Guiana, and Amazon basin in Brazil and Peru."

From Nico (2018):

"Tropical America. The true *Hemigrammus ocellifer* is native to drainages in northeastern South America, including French Guiana, Guyana, and Venezuela (Géry 1977)."

From Fricke et al. (2018):

"Distribution: Amazon River basin: Ecuador, Guyana, Suriname, French Guiana, Peru, Bolivia, Colombia and Brazil."

Introduced

From FAO (2018):

"*Hemigrammus ocellifer* introduced to Philippines […]"

"Status of the introduced species in the wild : Unknown"

According to Froese and Pauly (2018), *H. ocellifer* is established in the wild in Trinidad.

Means of Introduction Outside the United States

From FAO (2018):

"Reasons of Introduction [to Philippines] : 1) ornamental"

From Froese and Pauly (2018):

"Population from Cunupia, Caroni [Trinidad] may have been a result of an accidental release."

Short Description

From Frankel (2002):

"Phenotypically beacon fish are brown to greenish-yellow in color with a silvery iridescence. At the level of the dorsal fin, a dark transverse bar surrounded by striking golden-yellow spots characterizes the species and gives it its popular name. […] a brilliant red spot at the base of its caudal fin further distinguishes *H. o. ocellifer*. […] it probably serves as an eyespot, mimicking the red color of the iris of the eye."

Biology

From Froese and Pauly (2018):

"Occurs along the coastal zone and prefers water bodies with little current. Lives in groups. Feeds on worms, small insects, crustaceans and plants [Mills and Vevers 1989]. The males are generally very much smaller and more svelte than the females. It is a very prolific species and its reproduction can easily be carried out in the aquarium [Planquette et al. 1996]."

Human Uses

From Froese and Pauly (2018):

"Fisheries: of no interest; aquarium: highly commercial"

From Seriously Fish (2018):

"Fairly widespread in nature. […] You're unlikely to see any wild fish for sale though. Due to its popularity it's commercially bred in huge numbers for the trade. Most of the ones on sale in the UK originate from Eastern Europe."

This species is in trade in the United States.

From That Fish Place (2018):

"Head & Tail Light Tetra - *Hemigrammus ocellifer* […] $1.99"

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-reportable diseases have been documented for this species.

Threat to Humans

From Froese and Pauly (2018):

"Harmless"

3 Impacts of Introductions

No information available.

4 Global Distribution

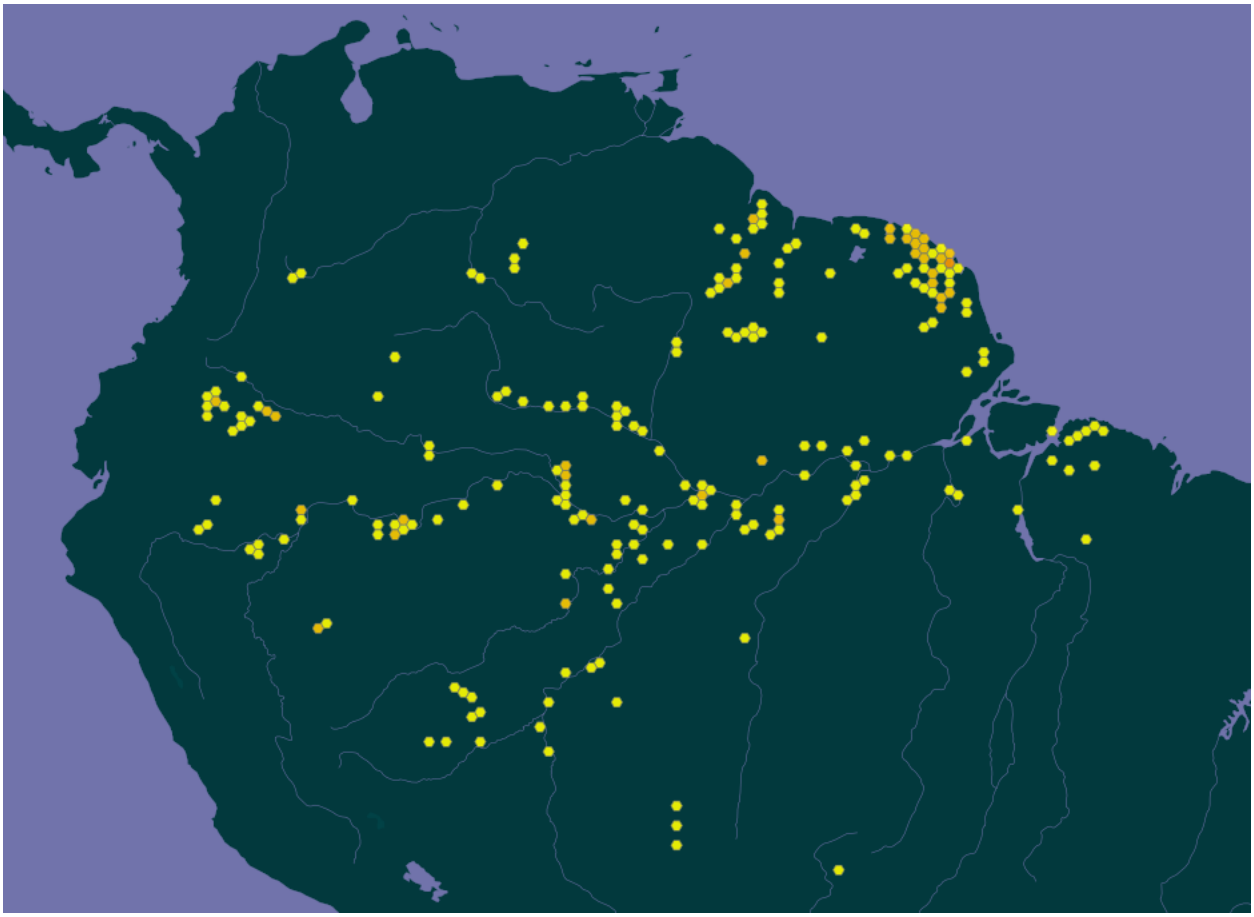

Figure 1. Known global distribution of *Hemigrammus ocellifer*, reported from the Amazon River basin and northern South America. Map from GBIF Secretariat (2017). A point in Alabama was excluded from the extent of this map and from climate matching because it represented another species and was included in the *H. ocellifer* distribution map in error. Points in the Orinoco River basin in Venezuela and Colombia were also excluded from climate matching because the establishment of *H. ocellifer* in the basin could not be verified. No points were available in GBIF for the established population in Trinidad.

5 Distribution Within the United States

Figure 2. Known distribution of *Hemmigramus ocellifer* in the United States, reported from Colorado. Map from Nico (2018). Point represents a failed population that occurred in a thermal spring and therefore was not included in climate matching.

6 Climate Matching

Summary of Climate Matching Analysis

The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.006, which is a medium climate match. A Climate 6 score between 0.005 and 0.103 indicates a medium climate match. The only state with a high climate score was Florida, and all other states had a low climate score. There was, however, an area of medium-low climate match along the Gulf Coast, and a medium-high match in southern Florida. The remainder of the contiguous United States had a low match.

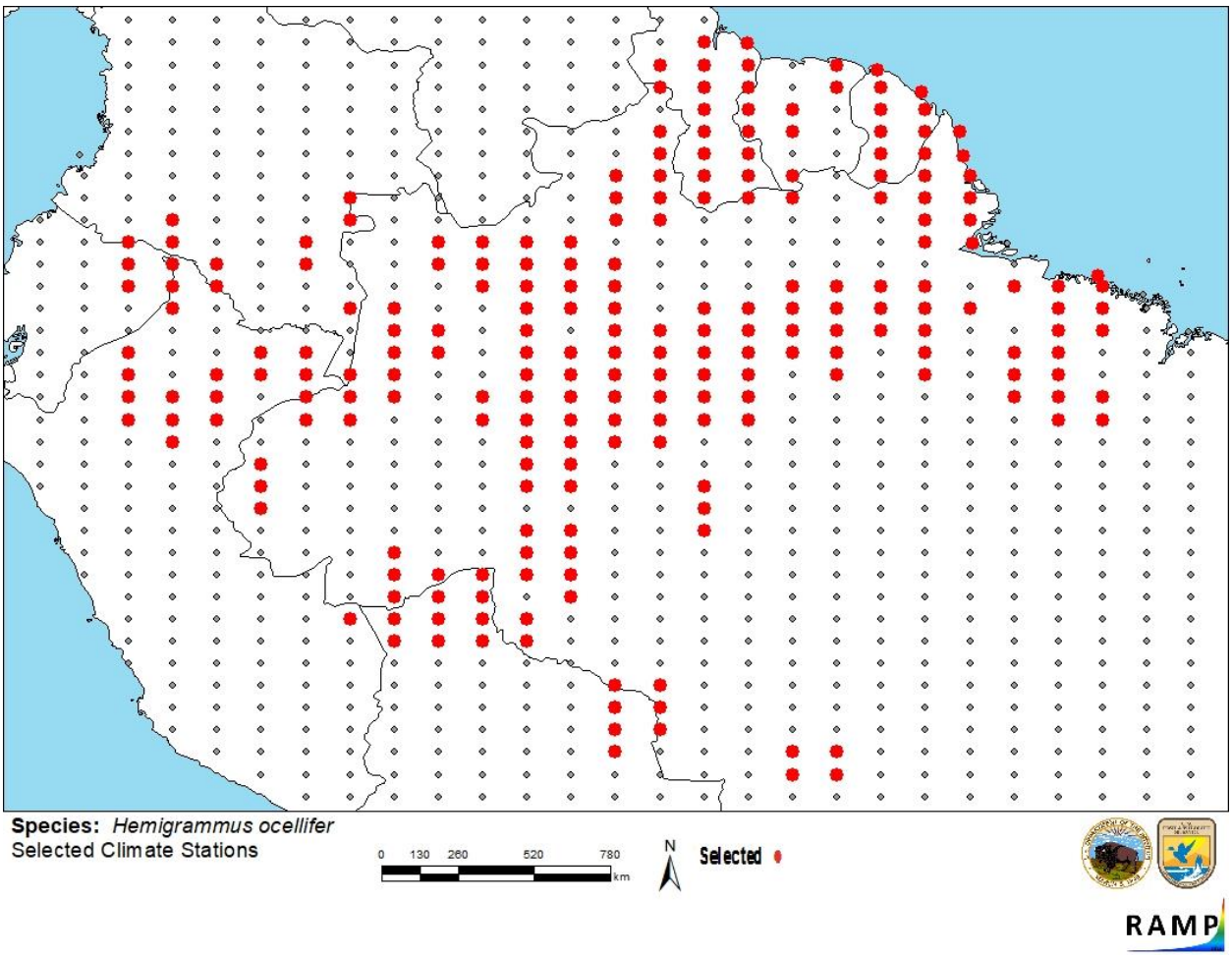

Figure 3. RAMP (Sanders et al. 2018) source map showing weather stations in northern South America selected as source locations (red; Brazil, French Guiana, Suriname, Guyana, Colombia, Ecuador, Peru, and Bolivia) and non-source locations (gray) for *Hemigrammus ocellifer* climate matching. Source locations from GBIF Secretariat (2017).

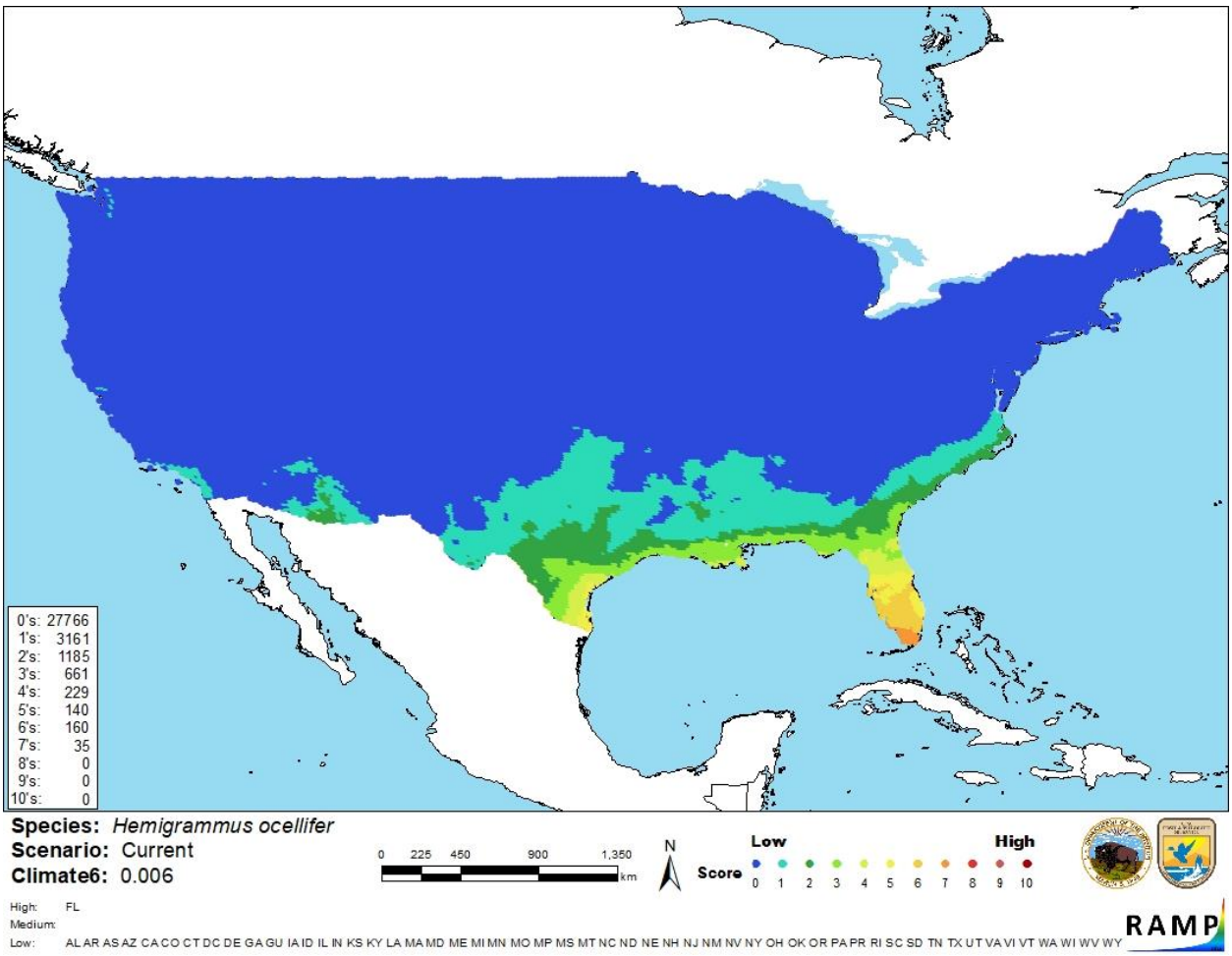

Figure 4. Map of RAMP (Sanders et al. 2018) climate matches for *Hemigrammus ocellifer* in the contiguous United States based on source locations reported by GBIF Secretariat (2017). 0= Lowest match, 10= Highest match.

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

There is some information available about the biology of *Hemigrammus ocellifer* and adequate documentation of its native range. An introduction of this species to the contiguous United States has been documented, but the population failed. Two other introductions have been documented, resulting in establishment in one location. No information is available on impacts of any of these introductions, so the certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Hemigrammus ocellifer, the Head-and-taillight Tetra, is a small freshwater fish species native to northern South America. This species was introduced to a thermal spring area in Colorado, but the population failed. Additionally, *H. ocellifer* has been introduced to Trinidad and the Philippines; establishment is confirmed only in Trinidad. No information is available on any impacts of introduction. *H. ocellifer* is popular in the aquarium trade, including in the United States. It has a medium climate match with the contiguous United States overall, and a high climate match in Florida. Information on impacts of introductions is needed to adequately assess the risk *H. ocellifer* poses to the contiguous United States. Certainty of this assessment is low, and 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**
- **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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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.

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