

Eastern Happy (*Astatotilapia calliptera*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, February 2011
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Photo: A. Tyers. Licensed under CC BY-SA 2.0. Available:
https://commons.wikimedia.org/wiki/File:Astatotilapia_calliptera_male.jpg. (January 2018).

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2017):

“Africa: Lakes Malawi, Chiuta and Chilwa; Lower Zambezi, Buzi, Pungwe and Save River systems.”

Froese and Pauly (2018) report that *A. calliptera* is native to Malawi, Mozambique, Tanzania, Zambia, and Zimbabwe.

Status in the United States

From Neilson and Fuller (2018):

“Specimens [*Astatotilapia calliptera*] were first collected from the Hillsboro Canal, Palm Beach County, Florida, in April 1998, and have been collected there sporadically through 2007 (Shafland et al. 2008). There has been no evidence for spread beyond that location.”

“Status: Unknown. Persistence over ~10 years and variable catch rates among years indicates that this species [*Astatotilapia calliptera*] has reproduced (Shafland et al. 2008). However, a lack of reported specimens since 2007 suggests that this species may be extirpated from Florida.”

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

From Imperial Tropicals (2015):

“*Astatotilapia Calliptera* "Eastern Happy" [...] \$ 27.99 [...] 3”-4” MALE”

Means of Introductions in the United States

From Neilson and Fuller (2018):

“Likely aquarium release.”

Remarks

From Neilson and Fuller (2018):

“Synonyms and Other Names: *Haplochromis callipterus* (Günther 1894)”

Information searches for this ERSS were conducted using both the synonym, *Haplochromis callipterus*, as well as the accepted scientific name, *Astatotilapia calliptera*, as search terms.

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 Acanthopterygii

Order Perciforme
Suborder Labroidei
Family Cichlidae
Genus *Astatotilapia*
Species *Astatotilapia calliptera* (Günther, 1894)”

From Eschmeyer et al. (2018):

“Current status: Valid as *Astatotilapia calliptera* (Günther 1894). Cichlidae: Pseudocrenilabrinae.”

Size, Weight, and Age Range

From Froese and Pauly (2017):

“Max length : 15.0 cm SL male/unsexed; [Eccles 1992]”

Environment

From Froese and Pauly (2017):

“Freshwater; benthopelagic. [...] 24°C - 28°C [Baensch and Riehl 1991; assumed to be recommended aquarium temperatures];

Climate/Range

From Froese and Pauly (2017):

“Tropical; [...] 13°S - 21°S”

Distribution Outside the United States

Native

From Froese and Pauly (2017):

“Africa: Lakes Malawi, Chiuta and Chilwa; Lower Zambezi, Buzi, Pungwe and Save River systems.”

Froese and Pauly (2018) report that *A. calliptera* is native to Malawi, Mozambique, Tanzania, Zambia, and Zimbabwe.

Introduced

This species has not been reported as introduced or established outside of its native range and the United States.

Means of Introduction Outside the United States

This species has not been reported as introduced or established outside of its native range and the United States.

Short Description

From Günther (1894):

“Teeth distinctly bicuspid, the cusps being short, subequal, and brownish; from twenty-seven to thirty-two (in very young specimens twenty-two) teeth on each side of the outer series of the upper jaw. Scales below the eye in three series. In a specimen 5 ½ inches long the diameter of the eye equals the width of the praeorbital and of the interorbital space, but is a little less than the depth of the scaly portion of the cheek. The angle formed by the praeopercular limbs is a right one. The height of the body is rather more than the length of the head, which is one third of the total (without caudal). The longest dorsal spine is the last and rather less than one half of the length of the head. Pectoral fin extending to the origin of the anal; caudal more or less scaleless. Scales roughened, with minute projections on the margin. Body dark-coloured, with the vertical fins blackish, the anal being ornamented by a series of large milky-white ocelli from two to four in number; in our largest specimen also the dorsal fin is ornamented with round light-colored spots. A black band running from the eye to the angle of the mouth seems to be constant.”

Biology

From Parsons et al. (2017):

“*Astatotilapia calliptera* is part of the Lake Malawi haplochromine radiation (Malinsky et al., 2017) but, unlike the other members of the flock that are lacustrine specialists it is a generalist, occupying both the littoral margins of Lake Malawi and peripheral habitats including rivers and shallow lakes. The main body of Lake Malawi is comparatively stable, with relatively minor changes in water level between seasons and over decadal timescales (Scholz et al., 2011). By contrast, peripheral water bodies are prone to both flooding in the wet season and drought or even complete habitat desiccation (e.g., Nicholson, 1998; for Lake Chilwa) in the dry season (Kingdon, Bootsma, Mwita, Mwichande, & Hecky, 1999; Pauw, Thurlow, & Van Seventer, 2010). This strong seasonal variability in water availability leads to associated changes in habitat productivity, thermal regime, and oxygen availability.”

From Froese and Pauly (2017):

“Occurs in vegetated areas in shallow water, but also found in rivers and streams around the lake. Feeds on invertebrates, algae, plants, small fishes and plankton [Konigs 1990]. Females mouthbrood eggs [Ribbink 1990].”

“Female lays batches of eggs on a substratum which the male begins to inseminate. Female collects the eggs almost immediately after laying a batch and incubates eggs in her mouth for 12-14 days at 26°C, releasing the young after which. Parent [*sic*] guards the young for 5-7 days, keeping them into [*sic*] her mouth when approached by predators or divers.”

From Bills et al. (2010):

“This species is abundant in lagoons and lower reaches of rivers, and is most abundant in quieter weedy areas. In Lake Malawi it is common at 2-4 m depth, but has been observed at 9 m. In the

Lower shire it is common in all types of habitats especially in the marshes. It has been observed to feed from plants as well as within the sand and on rock surfaces. This feeding behaviour suggests that it is an omnivore.”

Human Uses

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

From Imperial Tropicals (2015):

“Astatotilapia Calliptera "Eastern Happy" [...] \$ 27.99 [...] 3”-4” MALE”

From Froese and Pauly (2017):

“Fisheries: commercial; aquarium: commercial”

From Bills et al. (2010):

“This species is harvested for human consumption.”

Diseases

No information available. No OIE-listed diseases have been documented for this species.

Threat to Humans

From Froese and Pauly (2017):

“Harmless”

3 Impacts of Introductions

From Neilson and Fuller (2018):

“Unknown. Could potentially compete with co-occurring native fishes for food; however, its relatively small size makes this species a potential prey item for larger piscivorous fishes.”

4 Global Distribution



Figure 1. Known global distribution of *Astatotilapia calliptera*. Map from GBIF Secretariat (2017). Locations in the United States, South Africa, Botswana, and northern Tanzania were excluded from the climate matching analysis because they do not represent confirmed established populations of *A. calliptera*.

5 Distribution Within the United States

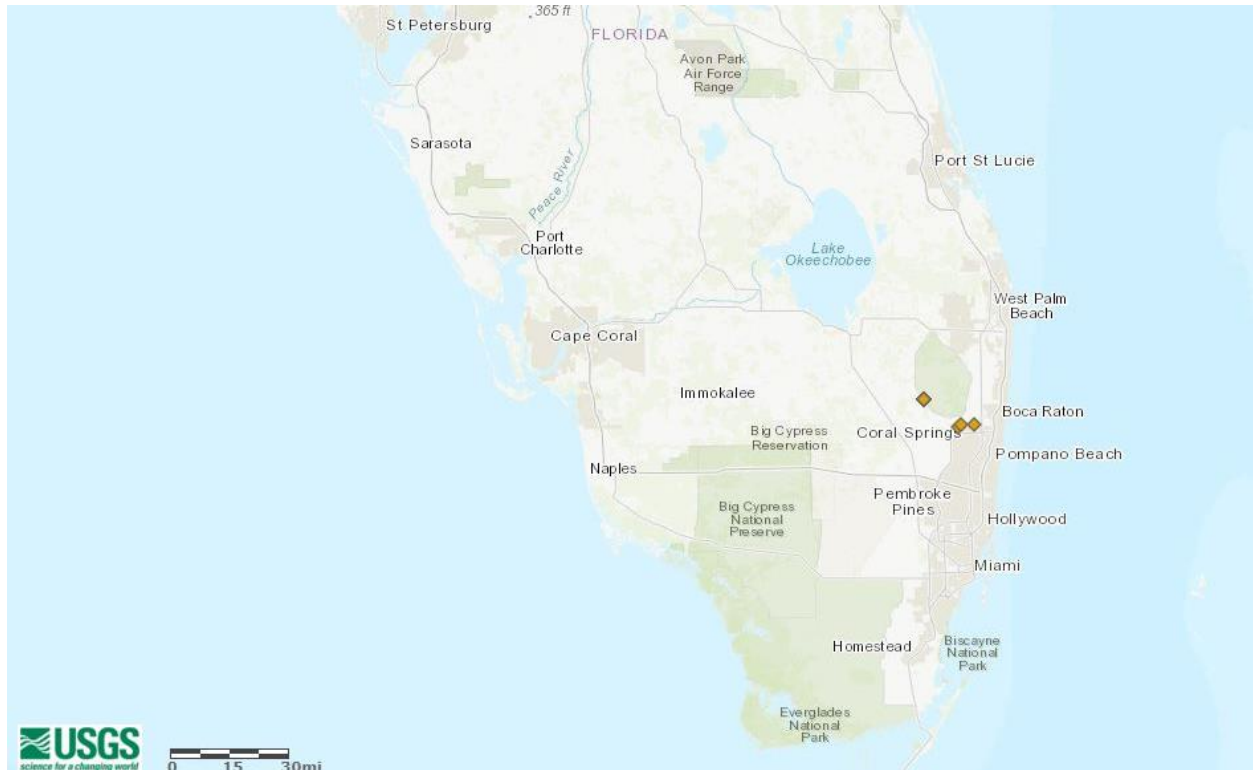


Figure 2. Known distribution of *Astatotilapia calliptera* in the United States. Map from Neilson and Fuller (2018). All occurrences were located in the Hillsboro Canal.

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. The climate match was high in southwestern Florida, and medium in much of the rest of peninsular Florida as well as along the U.S.-Mexico border from Texas to Arizona and in coastal southern California. The climate match elsewhere in the contiguous United States was low.

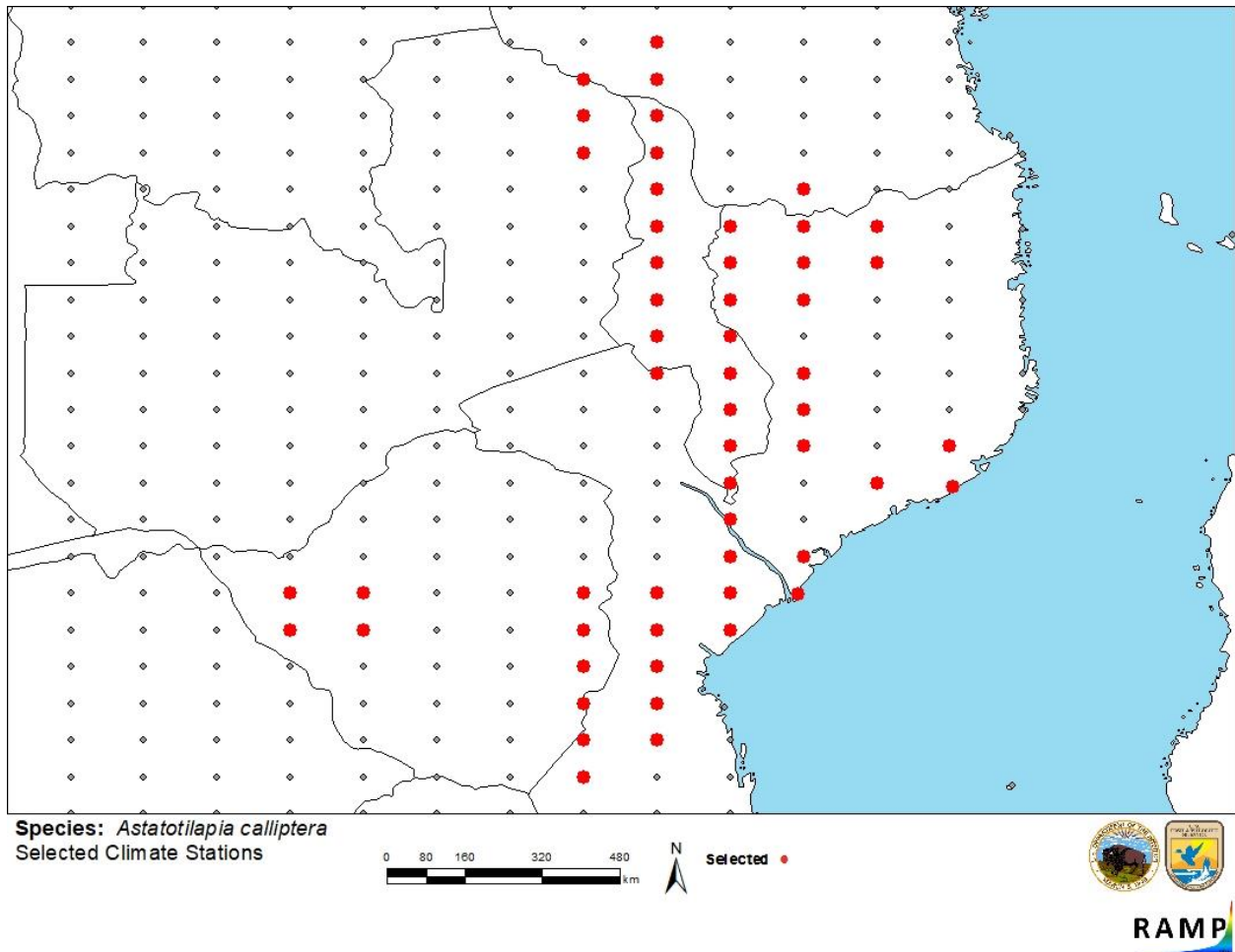


Figure 3. RAMP (Sanders et al. 2018) source map showing weather stations in southeastern Africa selected as source locations (red; Tanzania, Malawi, Mozambique, Zambia, Zimbabwe) and non-source locations (gray) for *Astatotilapia calliptera* climate matching. Source locations from GBIF Secretariat (2017).

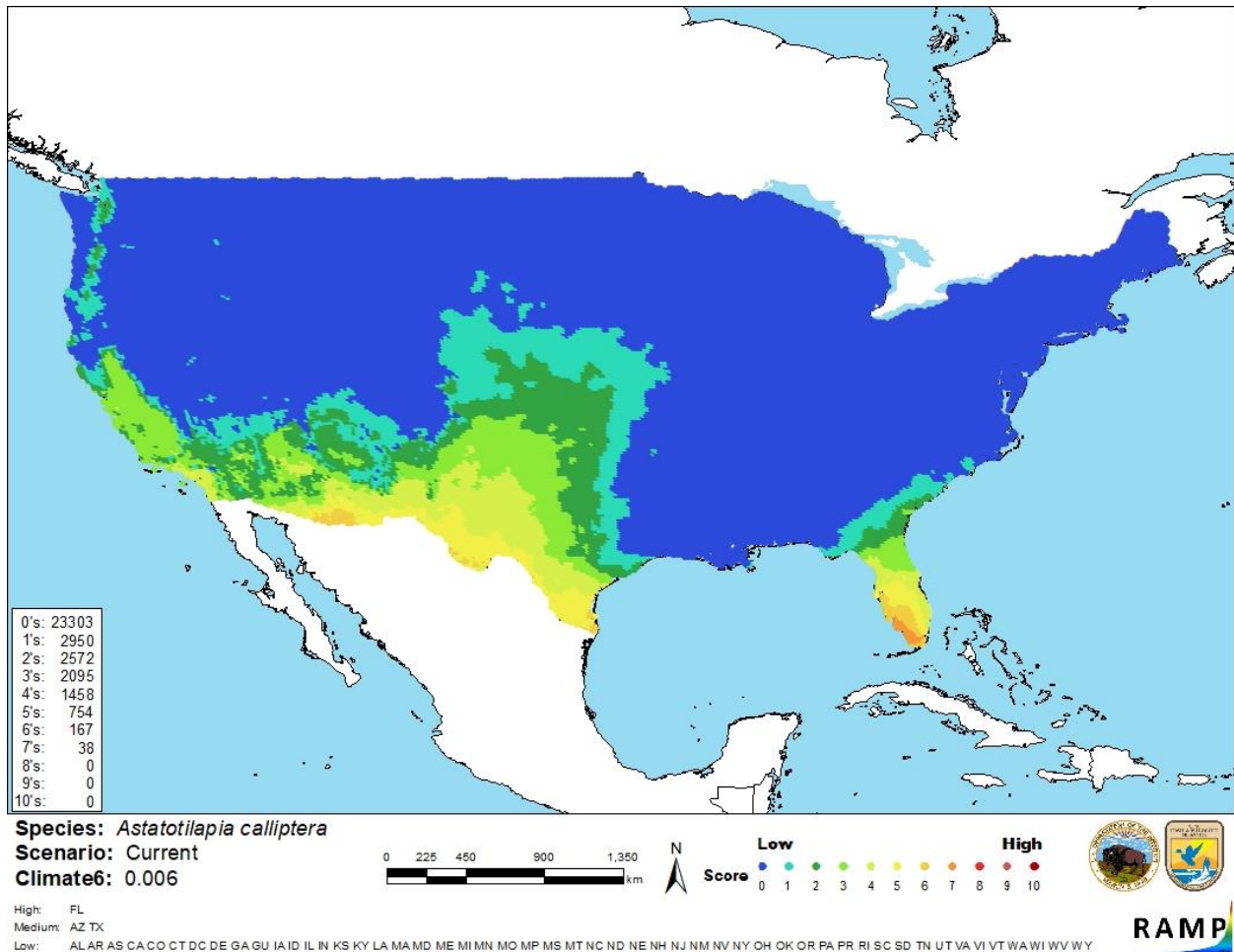


Figure 4. Map of RAMP (Sanders et al. 2018) climate matches for *Astatotilapia calliptera* in the contiguous United States based on source locations reported by GBIF Secretariat (2017). 0=Lowest match, 10=Highest match.

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 on the biology and habitat requirements of *Astatotilapia calliptera*. This species has been documented as introduced to Florida, but the current status of the population there is unknown. No negative impacts of introductions of this species have been documented. Further information is needed to adequately assess the risk this species poses if introduced to the United States. Certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Eastern Happy (*Astatotilapia calliptera*) is a cichlid species native to Africa. *A. calliptera* is sold for aquaria and used as a food fish, including commercial fishing. This species has been introduced to southern Florida, likely through aquarium release, and may be reproducing there, but the current status of this population is unknown as it has not been caught since 2007.

A. calliptera has a medium climate match with the contiguous United States, with the areas of highest match located in Florida, where it has been reported, and along the U.S.-Mexico border. Besides the isolated population of this species in Florida, no other introductions of this species into the United States have been documented. No impacts of this species on native ecosystems have been documented. Further information is needed to adequately assess what risk, if any, this species poses. 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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