

Zebra Tilapia (*Tilapia buttikoferi*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, June 2015



Photo: "Tilapia buttikoferi - aqua porte dorée 02" by Cedricguppy - Looury Cédric - Own work. Licensed under CC BY-SA 4.0 via Wikimedia Commons - https://commons.wikimedia.org/wiki/File:Tilapia_buttikoferi_-_aqua_porte_dor%C3%A9e_02.JPG#/media/File:Tilapia_buttikoferi_-_aqua_porte_dor%C3%A9e_02.JPG.

1 Native Range, and Status in the United States

Native Range

From Fuller et al. (2015):

“Western Africa: Lower reaches of coastal rivers from Guinea-Bissau (Geba and Corubal Rivers) to west Liberia (St. John River) (Teugels and Thys van den Audenaerde 1991).”

Status in the United States

From Fuller et al. (2015):

“In Florida, the zebra tilapia was first collected in 2005 and is now established in Snapper Creek Canal. It has been collected in Tamiami Canal where its status is unknown (Shafland et al. 2008).”

However, as those two canal systems are linked, it is likely to be established in Tamiami Canal as well.”

“A single large fish, identified by two experts, was collected from the Rappahannock River near Fredericksburg, in Virginia in July 2000 (W. Wieland, personal communication). This was the first report of this species in the USA. A second fish was collected from a park in Ann Arbor, Michigan in 2004 (Guerin 2004).”

“Status: Established in Florida. Failed in Virginia and Michigan.”

Means of Introductions in the United States

From Fuller et al. (2015):

“Aquarium releases, despite being illegal to keep in FL.”

Remarks

From Fuller et al. (2015):

“Although one expert informs us that they are illegal in Florida, he also observed them in 1999 for sale at a pet shop in South Florida. Those fish were confiscated by FL Wildlife Officers.”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2015):

“Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Osteichthyes
Class Actinopterygii
Subclass Neopterygii
Infraclass Teleostei
Superorder Acanthopterygii
Order Perciformes
Suborder Labroidei
Family Cichlidae
Genus *Tilapia*
Species *Tilapia buttikoferi* (Hubrecht, 1881)”

“Taxonomic Status: valid”

Size, Weight, and Age Range

From Froese and Pauly (2015):

“Max length : 30.8 cm SL male/unsexed; [Teugels and Thys van den Audenaerde 1992]”

Environment

From Froese and Pauly (2015):

“Freshwater; benthopelagic; pH range: 6.5 - 7.0; dH range: 15 - ?.”

Climate/Range

From Froese and Pauly (2015):

“Tropical; 23°C - 25°C [Baensch and Riehl 1985]; 14°N - 4°N”

Distribution Outside the United States

Native

From Lalèyè (2010):

“Guinea; Guinea-Bissau; Liberia; Sierra Leone”

Introduced

From Froese and Pauly (2015):

“Japan – established”

“Singapore – established”

Means of Introduction Outside the United States

From Froese and Pauly (2015):

“Unknown”

“Ornamental”

Short description

From Froese and Pauly (2015):

“Dorsal spines (total): 13 - 15; Dorsal soft rays (total): 14-16; Anal spines: 3; Anal soft rays: 10 - 11. Diagnosis: lower pharyngeal bone about as long as broad, and with anterior lamella shorter than toothed area; median pharyngeal teeth broadened when compared to the lateral teeth; 5-6 series of scales on cheeks; 4.5-6 scales between first dorsal fin spine and upper lateral line; dark vertical bars broader than lighter inter-spaces [Teugels and Thys van den Audenaerde 2003].”

Biology

From Fuller et al. (2015):

“Prefers freshwater lakes and coastal rivers in tropical/subtropical areas. Male-female pairs cooperatively excavate a depression or pit in the sediment until they reach a solid substrate. Both pairs guard nest and young.”

Human uses

From Lalèyè (2010):

“This species is harvested for human consumption.”

From Fuller et al. (2015):

“Aquarium”

Diseases

From Froese and Pauly (2015):

“Hole-in-the-Head Disease, Parasitic infestations (protozoa, worms, etc.)”

“Bacterial Infections (general), Bacterial diseases”

Threat to humans

From Froese and Pauly (2015):

“Harmless”

3 Impacts of Introductions

From Fuller et al. (2015):

“Unknown. Likely to be similar to closely related *T. mariae* in Florida.”

4 Global Distribution



Figure 1. Distribution of *T. buttikoferi*. Map from GBIF (2015). Locations in Hong Kong and Thailand, and all U.S. locations except southern Florida were excluded from climate matching because these locations do not represent extant populations.

5 Distribution within the United States

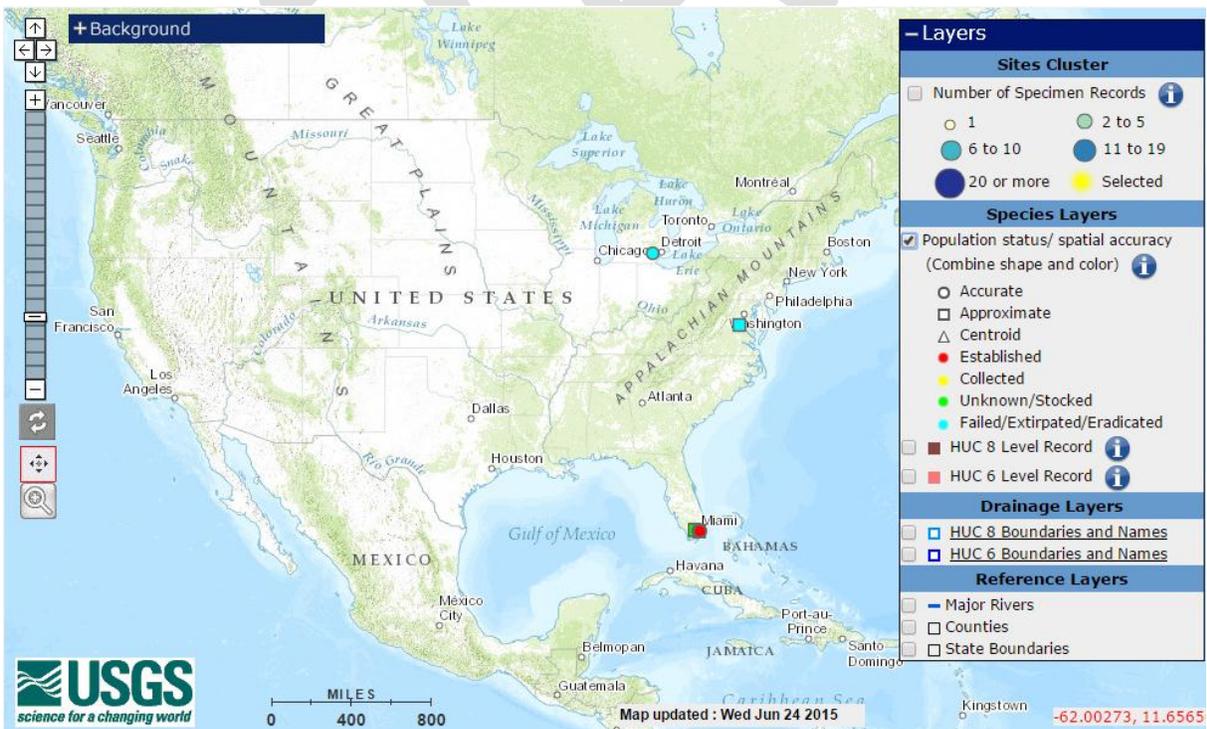


Figure 2. Distribution of *T. buttikoferi* in the U.S. Map from Fuller et al. (2015).

6 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean Distance) is medium to high in peninsular Florida and low elsewhere in the contiguous U.S. Climate 6 proportion indicated that the contiguous U.S. has a medium climate match. The range for a medium climate match is 0.005 to 0.103; the climate match of *T. buttikoferi* is 0.014.

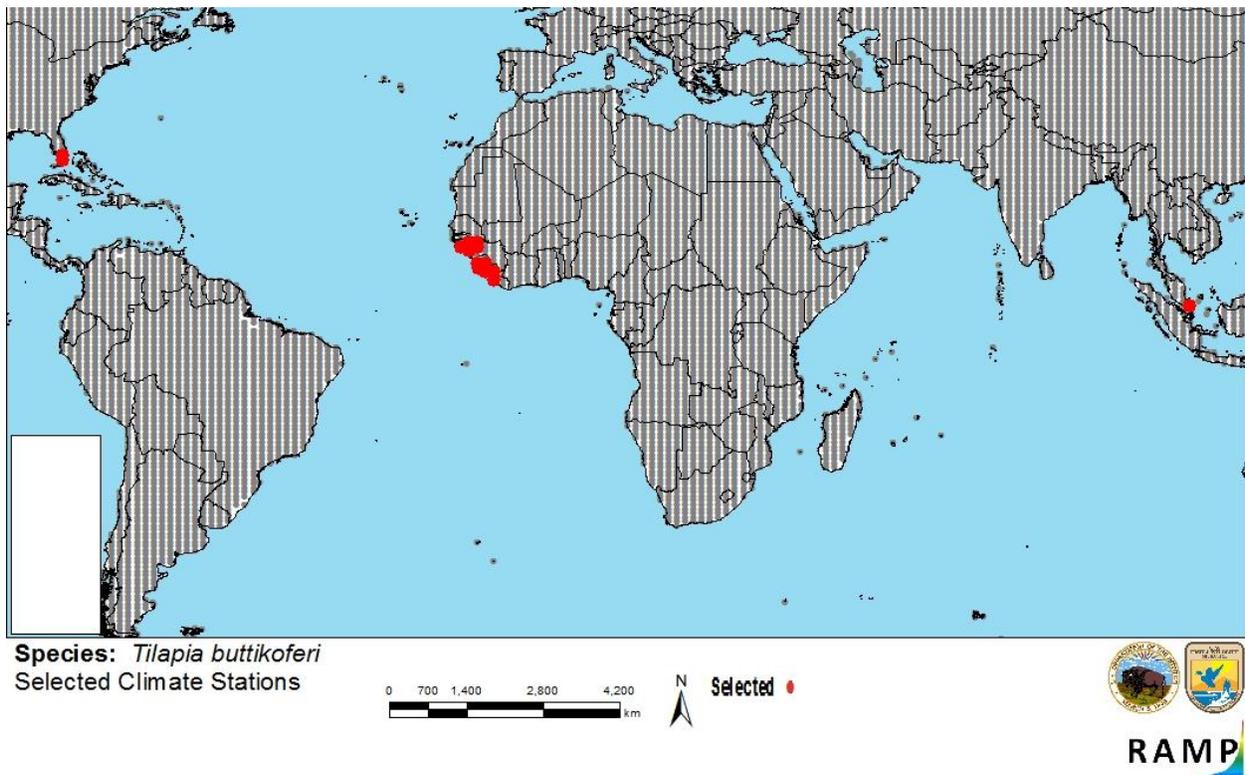


Figure 3. RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red) and non-source locations (gray) for *T. buttikoferi* climate matching. Source locations from GBIF (2015) and Fuller et al. (2015). Only established locations were used.

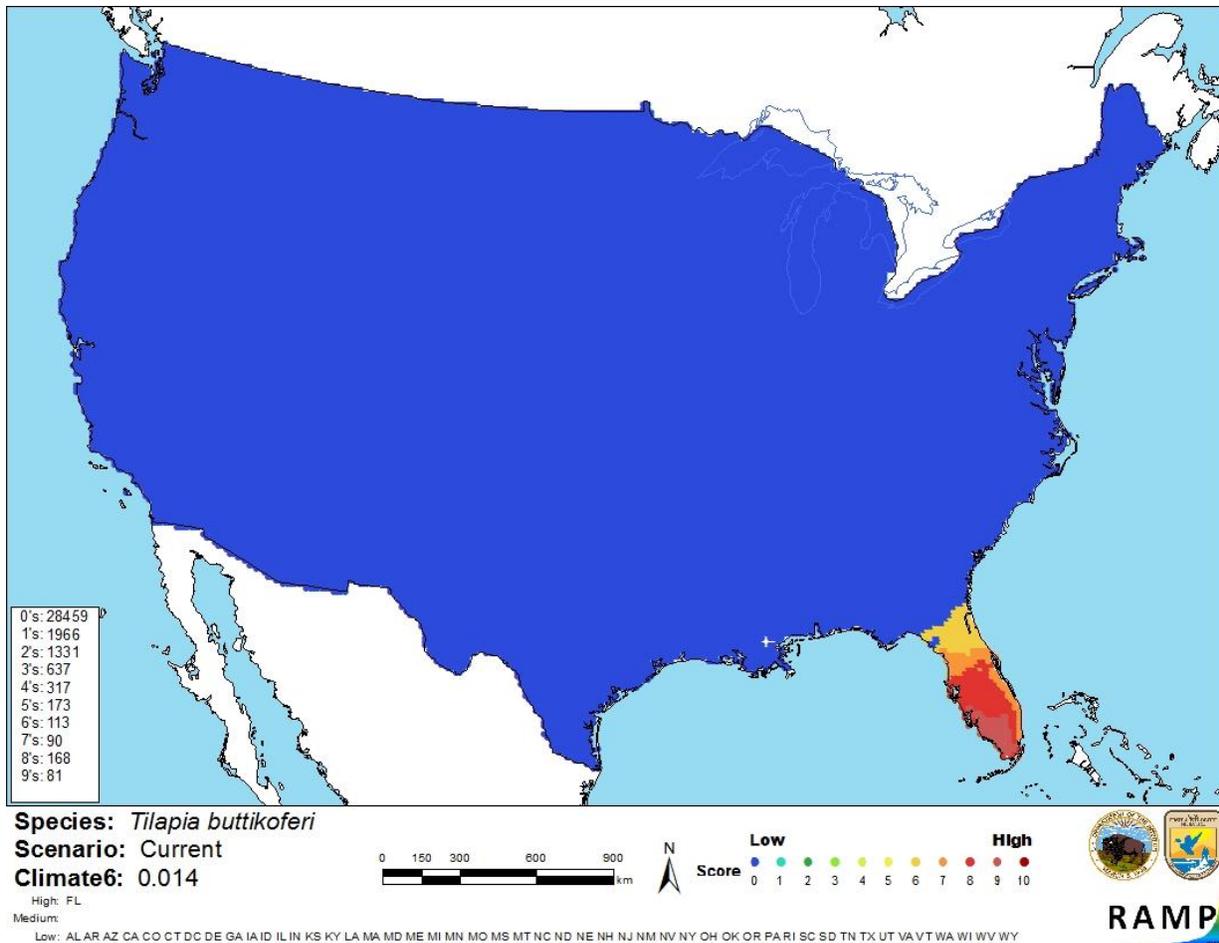


Figure 4. Map of RAMP (Sanders et al. 2014) climate matches for *T. buttikoferi* in the continental United States based on source locations reported by GBIF (2015) and Fuller et al. (2015). 0= Lowest match, 10=Highest match. Counts of climate match scores are tabulated on the left.

7 Certainty of Assessment

Information on the biology, ecology, and distribution of *T. buttikoferi* is somewhat limited. Although established populations of *T. buttikoferi* exist outside its native range, no scientific publications describe the effects of these introduced populations. Certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Continental United States

Tilapia buttikoferi is a benthopelagic cichlid native to West Africa. It is used in the aquarium trade, which has led to its establishment in both Florida and Singapore. At present, no scientific publications describe the effects of these introduced populations on native species. However, one source suggests that effects may be similar to those produced by *Tilapia mariae*, a related species with high history of invasiveness. Climate match of *T. buttikoferi* to the contiguous U.S. is

medium. With uncertain history of invasiveness, the overall risk posed by this species is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3):** Uncertain
- **Climate Match (Sec.6):** Medium
- **Certainty of Assessment (Sec. 7):** Low
- **Overall Risk Assessment Category: Uncertain**

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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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- Sanders, S., C. Castiglione, and M. Hoff. 2014. Risk Assessment Mapping Program: RAMP. US 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.

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