U.S. Fish & Wildlife Service

Victoria Tilapia (*Oreochromis variabilis*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, March 2012
Revised, May 2018
Web Version, 8/6/2019

Photo: seasav. Licensed under Creative Commons BY-NC-ND. Available: https://www.inaturalist.org/photos/9825219. (August 2019).

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2018):

"Africa: Lake Victoria and its affluent rivers [Kenya, Tanzania, Uganda]; the Victoria Nile above the Murchison Falls; Lakes Kyoga, Kwania and Salisbury [Trewavas and Teugels 1991]. It is strongly declining or has disappeared in many areas of the Lake Victoria drainage [Seegers et al. 2003]."

Status in the United States

This species has not been reported in the United States. There is no indication that this species is in trade in the United States, based on a search of the literature and online aquarium retailers.

The following regulations may apply to *O. variabilis* Some refer to "tilapia" and are not always clear whether referring to the genus *Tilapia* or tilapiine cichlids, in general (of which there are more than 10 genera).

From FFWCC (2018):

"Prohibited nonnative species are considered to be dangerous to the ecology and/or the health and welfare of the people of Florida. These species are not allowed to be personally possessed or used for commercial activities. Very limited exceptions may be made by permit from the Executive Director […]
[The list of prohibited nonnative species includes] *Oreochromis variabilis*"

From Minnesota DNR (2019):

"Minnesota has several state laws intended to minimize the introduction and spread of invasive species of wild animal and aquatic plants in the state. Using a four-tiered system, invasive species are classified as **prohibited**, **regulated**, **unregulated nonnative species**, or are unclassified and remain as **unlisted nonnative species**."

"It is legal to possess, sell, buy, and transport regulated invasive species [in Minnesota], but they may not be introduced into a free-living state, such as being released or planted in public waters. The regulated invasive species are: […]
tilapia (*Oreochromis*, *Sarotherodon*, and *Tilapia* spp.)"

From Montana Fish, Wildlife & Parks (2019):

"Prohibited species are live, exotic wildlife species, subspecies, or hybrid of that species, including viable embryos or gametes, that may not be possessed, sold, purchased, exchanged, or transported in Montana, except as provided in MCA 87-5-709 or ARM 12.6.2220 […]
Tilapia (*Oreochromis* spp.)"

From Oklahoma Secretary of State (2018):

"(1) The sale and use of all Tilapia species as bait is prohibited.
(2) The stocking of all Tilapia species in any heated-water reservoir including Sooner, Konawa and Boomer Reservoirs is prohibited.
(3) This shall not interfere with the sale of dead and/or processed Tilapia for human food or the sale or transport of Tilapia species for the purpose of aquatic vegetation control in privately owned ponds."

From Texas Parks and Wildlife Department (2019):

"The organisms listed here are legally classified as exotic, harmful, or potentially harmful. No person may possess or place them into water of this state except as authorized by the [Texas Parks and Wildlife] department. Permits are required for any individual to possess, sell, import, export, transport or propagate listed species for zoological or research purposes; for aquaculture (allowed only for Blue, Nile, or Mozambique tilapia, Triploid Grass Carp, or Pacific White Shrimp); or for aquatic weed control (for example, Triploid Grass Carp in private ponds). […]
Tilapia, Family Cichlidae
All species of genera *Tilapia*, *Oreochromis* and *Sarotherodon*"

Oreochromis spp. are listed as restricted in the State of Vermont (Vermont Fish and Wildlife Regulations 2009).

From Virginia DGIF (2019):

"A special permit is required, and may be issued by the Department, if consistent with the Department's fish and wildlife management program, to import, possess, or sell the following non-native (exotic) amphibians, fish, mollusks, aquatic invertebrates, and reptiles: […] tilapia […]."

Means of Introductions in the United States

This species has not been reported 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 Acanthopterygii
Order Perciformes
Suborder Labroidei
Family Cichlidae
Genus *Oreochromis*
Species *Oreochromis variabilis* (Boulenger, 1906)"

From Fricke et al. (2019):

"**Current status:** Valid as *Oreochromis variabilis* (Boulenger 1906). Cichlidae: Pseudocrenilabrinae."

Size, Weight, and Age Range

From Froese and Pauly (2018):

"Max length : 30.0 cm SL male/unsexed; [van Oijen 1995]"

Environment

From Froese and Pauly (2018):

"Freshwater; benthopelagic; depth range 4 - 49 m. 24°C - 28°C [Baensch and Riehl 1991; assumed to represent recommended aquarium temperature range]"

Climate/Range

From Froese and Pauly (2018):

"Tropical;"

Distribution Outside the United States

Native

From Froese and Pauly (2018):

"Africa: Lake Victoria and its affluent rivers [Kenya, Tanzania, Uganda]; the Victoria Nile above the Murchison Falls; Lakes Kyoga, Kwania and Salisbury [Trewavas and Teugels 1991]. It is strongly declining or has disappeared in many areas of the Lake Victoria drainage [Seegers et al. 2003]."

Introduced

This species has no reported introductions.

Means of Introduction Outside the United States

This species has no reported introductions.

Short Description

From Froese and Pauly (2018):

"Dorsal spines (total): 16 - 18; Dorsal soft rays (total): 10-12; Anal spines: 3; Anal soft rays: 9 - 11; Vertebrae: 29 - 31. Margin of the dorsal fin orange in females and non-breeding males; intense orange to scarlet in breeding males. Profile convex immediately before the eye. Usually 2 rows of scales on cheek. Caudal not heavily scaled. Preserved specimens often show 2-3 vague dark mid-lateral blotches and one on top of the peduncle. Body color grey-green [Eccles 1992]."

Biology

From Froese and Pauly (2018):

"Occurs at temperatures ranging from 23.0-28.0 °C [Philippart and Ruwet 1982]. Occasionally forms schools. Is mainly diurnal. Adults feed predominantly on bottom algae, some of the planktonic organisms that are found in their stomachs are probably those which have settled on the bottom or were washed shorewards from open waters but they do feed directly on plankton [Trewavas 1983]."

"Nests are built on sandy bottoms in shallow waters. Each nest consists of a central shallow saucer 13-15 cm in diameter, around which is a circle of small pits. This structure is the center of a larger pit, 30-39 cm in diameter. Breeding pair makes the T-stand. Female lays batches of eggs; picks them up and sucks at the male's genital tassel."

Human Uses

From Froese and Pauly (2018):

"Fisheries: commercial; aquaculture: experimental; aquarium: commercial"

Diseases

No OIE-reportable diseases (OIE 2019) have been documented in this species.

From Froese and Pauly (2018):

"Lymphocystis Disease, Viral diseases
Trypanosoma Infection, Parasitic infestations (protozoa, worms, etc.)
Sporozoa-infection (Myxobolus sp.), Parasitic infestations (protozoa, worms, etc.)
Dactylosoma Infection 1, Parasitic infestations (protozoa, worms, etc.)
Cichlidogyrus Disease, Parasitic infestations (protozoa, worms, etc.)
Cichlidogyrus Infestation 2, Parasitic infestations (protozoa, worms, etc.)
Cichlidogyrus Infestation 10, Parasitic infestations (protozoa, worms, etc.)
Trypanosoma Infestation 2, Parasitic infestations (protozoa, worms, etc.)
Dactylosoma Infection 1, Parasitic infestations (protozoa, worms, etc.)"

Threat to Humans

From Froese and Pauly (2018):

"Harmless"

3 Impacts of Introductions

This species has no reported introductions.

The following regulations may apply to *O. variabilis*. Some refer to "tilapia" and are not always clear whether referring to the genus *Tilapia* or tilapiine cichlids, in general (of which there are more than 10 genera).

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4 Global Distribution

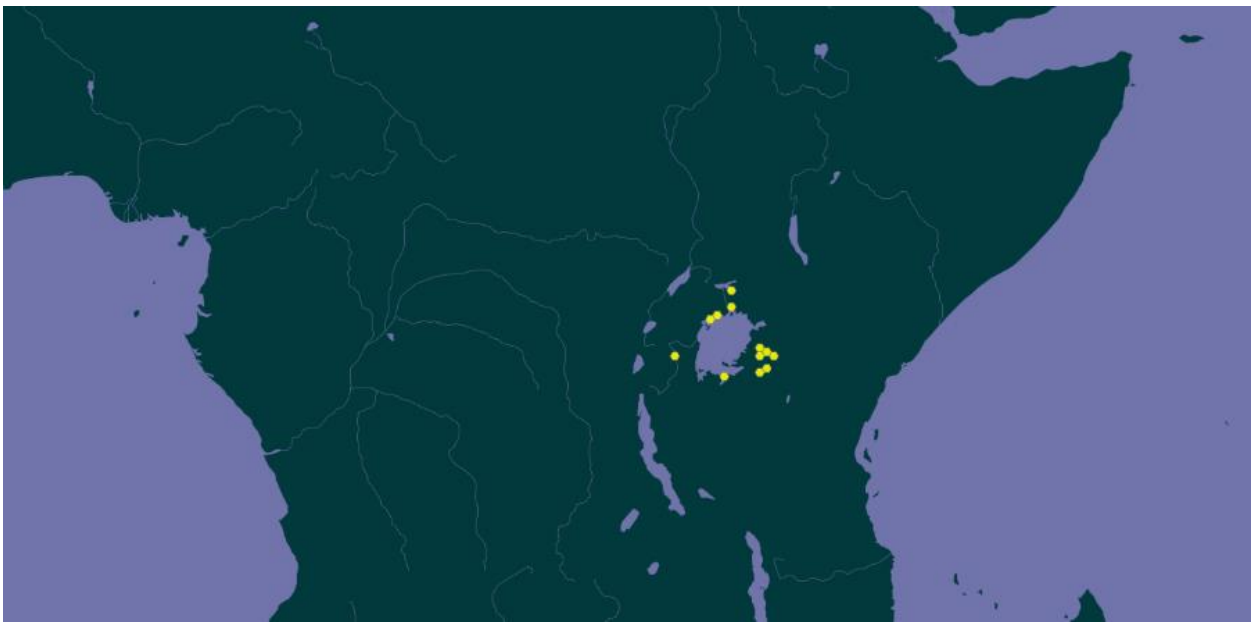


Figure 1. Reported global distribution of *Oreochromis variabilis*, recorded in East Central Africa. Map from GBIF Secretariat (2017).

5 Distribution Within the United States

This species has not been reported in the United States.

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 0.0, indicating a low climate match overall. (Scores between 0.000 and 0.005, inclusive, are classified as low.) The climate match was medium in peninsular Florida, coastal Texas, the southern tip of Louisiana and coastal southern California; all other areas of the contiguous United States showed low match. All States had a low climate score, except Florida, which was medium.

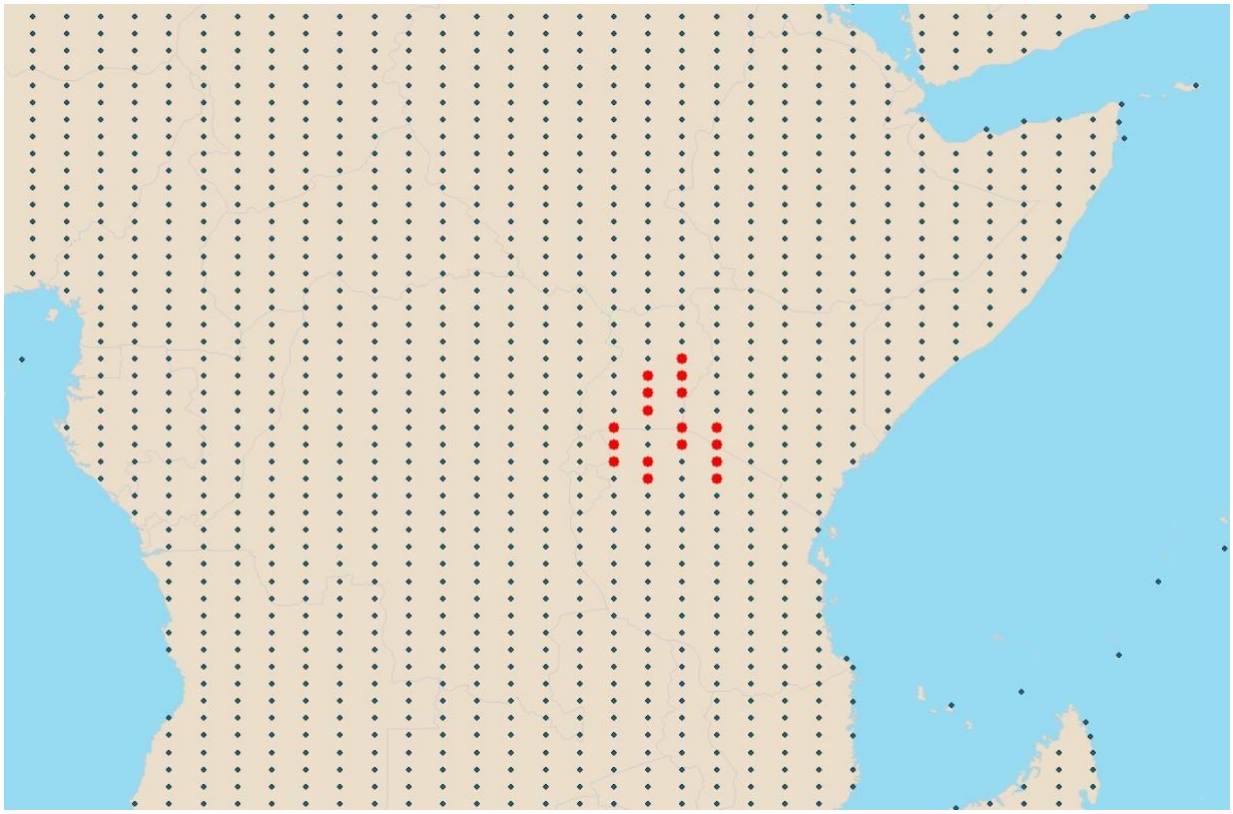
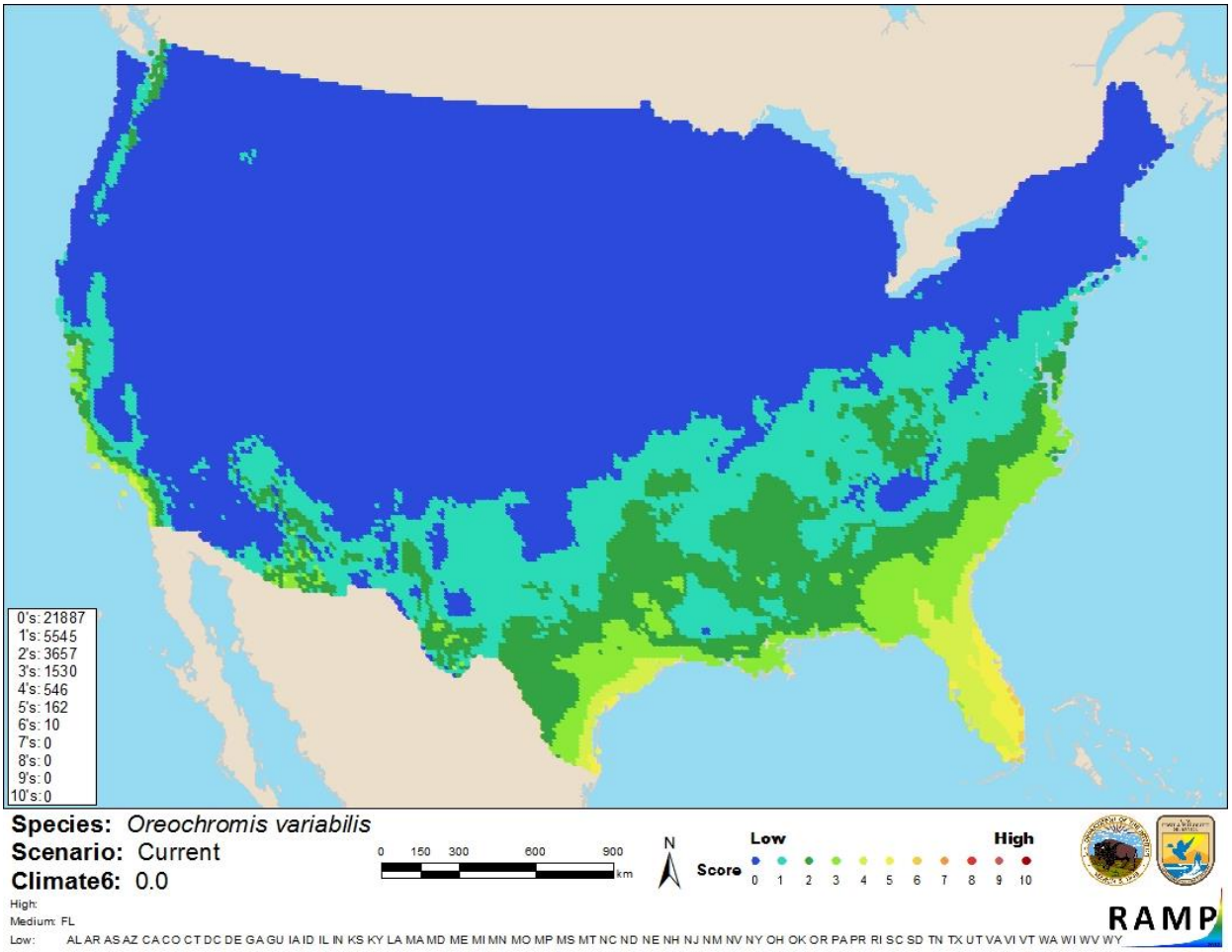


Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in East Central Africa selected as source locations (red; Uganda, Rwanda, Tanzania, and Kenya) and non-source locations (gray) for *Oreochromis variabilis* climate matching. Source locations from GBIF Secretariat (2017).

Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *Oreochromis variabilis* 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 *Oreochromis variabilis* is available, but there have been no introductions reported outside the native range. More information is needed on potential impacts of introduction. The certainty of assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Oreochromis variabilis, Victoria Tilapia, is a freshwater fish found in East Central Africa. This species has no history of introductions outside of its native range, and history of invasiveness is uncertain. *O. variabilis* is commercially fished and is present in the aquarium trade outside the United States. It is used experimentally in aquaculture. Numerous U.S. States have prohibited or restricted the possession or trade of this species. This fish has a low climate match with the contiguous United States. Due to lack of knowledge about potential introductions, certainty of assessment is low. The overall risk for this species 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.

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Virginia DGIF (Virginia Department of Game and Inland Fisheries). 2019. Nongame fish, reptile, amphibian and aquatic invertebrate regulations. Virginia Department of Game and Inland Fisheries, Henrico, Virginia.

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. 1991. Aquarien atlas, volume 3. Mergus, Verlag für Natur- und Heimtierkunde, Melle, Germany.

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