

Sabaki Tilapia (*Oreochromis spilurus*)

Ecological Risk Screening Summary

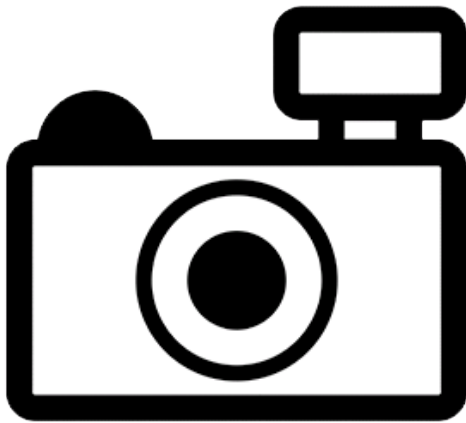
U.S. Fish & Wildlife Service, February 2011

Revised, July 2018

Web Version, 5/6/2020

Organism Type: Fish

Overall Risk Assessment Category: Uncertain



No Photo Available

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2020):

“Africa: Coastal rivers of Kenya from the Mwena River to the lower Athi below Lugard's Falls; also near its mouth, including Lake Chem Chem; Lower and middle Tana River, Northern Uaso Nyiro, Juba system and Webi Shebeli; Nguruman; and Ethiopia.”

“Known from the Wabi Shebele basin [Ethiopia] [Getahun 2007].”

“Known from the coastal rivers of Kenya from the Mwena River near the Tanzania border [Trewavas 1983; Seegers et al. 2003] to the Sabaki-Galana below Lugard's Fall [Trewavas 1983; Skelton 1994; Seegers et al. 2003]. It is also known from pools and lakes in the Athi flood-plain and coastal lagoons near its mouth [Trewavas 1983; Okeyo 1998; Seegers et al. 2003], including the warm and saline Lake Chem Chem [Trewavas 1983; Seegers et al. 2003], and Voi [Okeyo 1998]. Further, it occurs in Lower and Middle Tana River [Trewavas 1983; Skelton 1994;

Seegers et al. 2003] and the Northern Ewaso Nyiro [Trewavas 1983; Seegers et al. 2003]. [...] The species does not occur in the Southern Ewaso Nyiro [Seegers et al. 2003].”

“Probably in Lake Momello, south of the Kenya-Tanzania border [Trewavas and Teugels 1991]; it is not clear whether this population is native or introduced, nor whether it has been correctly identified, nor even if it is still extant [Genner et al. 2018; Shechonge et al. 2019].”

Froese and Pauly (2020) also list *Oreochromis spilurus* as native to Somalia.

Status in the United States

No records of *Oreochromis spilurus* occurrences in the United States were found. No information on trade of *O. spilurus* in the United States was found.

The Florida Fish and Wildlife Conservation Commission has listed the tilapia, *Oreochromis spilurus* as a prohibited species. Prohibited nonnative species (FFWCC 2020), "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."

Means of Introductions in the United States

No records of *Oreochromis spilurus* occurrences in the United States were found.

Remarks

From Froese and Pauly (2020):

“Three subspecies are recognized: *Oreochromis spilurus niger*, *Oreochromis spilurus percivali* and *Oreochromis spilurus spilurus*.”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

According to Eschmeyer et al. (2018), *Oreochromis spilurus* (Günther 1894) is the current valid name of this species.

From ITIS (2018):

Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Actinopterygii
Class Teleostei
Superorder Acanthopterygii
Order Perciformes

Suborder Labroidae
Family Cichlidae
Genus *Oreochromis*
Species *Oreochromis spilurus* (Günther, 1894)

Size, Weight, and Age Range

From Froese and Pauly (2020):

“Max length : 19.2 cm SL male/unsexed; [Trewavas 1983]; 16.3 cm (female)”

Environment

From Froese and Pauly (2020):

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

Climate

From Froese and Pauly (2020):

“Tropical; [...]; 23°N - 7°S”

Distribution Outside the United States

Native

From Froese and Pauly (2020):

“Africa: Coastal rivers of Kenya from the Mwena River to the lower Athi below Lugard's Falls; also near its mouth, including Lake Chem Chem; Lower and middle Tana River, Northern Uaso Nyiro, Juba system and Webi Shebeli; Nguruman; and Ethiopia.”

“Known from the Wabi Shebele basin [Ethiopia] [Getahun 2007].”

“Known from the coastal rivers of Kenya from the Mwena River near the Tanzania border [Trewavas 1983; Seegers et al. 2003] to the Sabaki-Galana below Lugard's Fall [Trewavas 1983; Skelton 1994; Seegers et al. 2003]. It is also known from pools and lakes in the Athi flood-plain and coastal lagoons near its mouth [Trewavas 1983; Okeyo 1998; Seegers et al. 2003], including the warm and saline Lake Chem Chem [Trewavas 1983; Seegers et al. 2003], and Voi [Okeyo 1998]. Further, it occurs in Lower and Middle Tana River [Trewavas 1983; Skelton 1994; Seegers et al. 2003] and the Northern Ewaso Nyiro [Trewavas 1983; Seegers et al. 2003]. [...] The species does not occur in the Southern Ewaso Nyiro [Seegers et al. 2003].”

“Probably in Lake Momello, south of the Kenya-Tanzania border [Trewavas and Teugels 1991]; it is not clear whether this population is native or introduced, nor whether it has been correctly identified, nor even if it is still extant [Genner et al. 2018; Shechonge et al. 2019].”

Froese and Pauly (2020) also list *Oreochromis spilurus* as native to Somalia.

Introduced

Froese and Pauly (2020) lists *Oreochromis spilurus* as introduced and established in Kuwait (through continuous restocking), Democratic Republic of the Congo (Zaire; 1950-1959), and Saudi Arabia (1985); as introduced and probably established in Uganda (1962; country record does indicate that natural reproduction has been recorded in the wild), Philippines (1985), and United Arab Emirates (1985; country record does indicate that natural reproduction has been recorded in the wild); and introduced and population status unknown in Egypt, Mozambique, Malta, Côte d'Ivoire (country record does indicate that natural reproduction has been recorded in the wild), Benin (country record does indicate that natural reproduction has been recorded in the wild), Congo (1960-1969), and Cameroon (1950); introduced and not established in Madagascar (1950); and introduced but no population status given in Zambia.

From Froese and Pauly (2020):

“Reported from Maniema Riv. (Lualaba drainage) [Democratic Republic of the Congo] [Moreau et al. 1988].”

“It is introduced in many dams and river systems [within Kenya] [Seegers et al. 2003], including Lake Kamnarok [Seegers et al. 2003], Lake Naivasha [Ogutu-Ohwayo and Hecky 1991], Kerio drainage [Seegers et al. 2003] and Lake Turkana system [Seegers et al. 2003].”

“Recorded from Batangas, Luzon [Philippines].”

“Probably in Lake Momello, south of the Kenya-Tanzania border [Trewavas and Teugels 1991]; it is not clear whether this population is native or introduced, nor whether it has been correctly identified, nor even if it is still extant [Genner et al. 2018; Shechonge et al. 2019].”

“Introduction record was created [for Malta] for consistency because of reports of commercial aquaculture production in this country which is not within the species' native range.”

“Introduced into Lake Bunyoni [Uganda] before 1958 but was unsuccessful. Otherwise stocked into dams elsewhere in the country.”

Means of Introduction Outside the United States

From Froese and Pauly (2020):

“Assumed to be introduced for aquaculture [in Malta and Philippines].”

The reason for introduction in the Congo, Democratic Republic of the Congo (Zaire), Kuwait, Cameroon, Madagascar, Uganda, and United Arab Emirates is listed as aquaculture; it is listed as aquaculture and fisheries for Benin, and Cote d'Ivoire; and aquaculture and research in Saudi Arabia (Froese and Pauly 2020).

Short Description

From Froese and Pauly (2020):

“Dorsal spines (total): 14 - 17; Dorsal soft rays (total): 10-13; Anal spines: 3; Anal soft rays: 9 - 10; Vertebrae: 28 - 30. Scales on cheek in 2 or 3 series. Genital papilla of male conical or club-shaped, with a sub-terminal pore. Females and immature males have a yellow-buff background color with a series of mid-lateral blotches and a more dorsal parallel series. Mature males golden-yellow; conspicuous bright blue areas on dorsal, anal and pelvic fins; orange or red dorsal lappets.”

Biology

From Froese and Pauly (2020):

“Feeds on insects, plants and diatoms [Trewavas 1983].”

“Spawns in shallow water with shelving bottom in ponds. Size of first spawning depends on population density (lower at higher densities). Mating pit is the size and shape of a saucer. Eggs probably fertilized before being taken into the mouth by the female, or are fertilized inside the mouth [Trewavas 1983].”

From Ridha et al. (1998):

“The tilapia, *Oreochromis spilurus* (Gunther), like many tilapia species, is capable of reproducing continuously throughout the year in areas where the photoperiod and water temperature vary only slightly throughout the year (Lowe-McConnell 1958; Siddique 1979; Lam 1983; Brummett 1995). However, this species shows a well-defined breeding season in Kuwait, and spawning occurs mainly during the warmest and most sunny months (AlAhmad, Ridha & Al-Ahmed 1988). Very little reproductive activity takes place during the winter months because of the decrease in water temperature and day length.”

Human Uses

From Froese and Pauly (2020):

“Aquaculture: commercial; aquarium: commercial”

“Exploited for food [in the Philippines].”

“A stock of this species is maintained and fingerlings are distributed for interested citizens [in the United Arab Emirates]”

From Lone and Ridha (1993):

“*Oreochromis spilurus* (Gunther) is being cultured in Kuwait in brackish and sea water because fresh water is very scarce.”

Diseases

No records of OIE-reportable diseases (OIE 2020) were found for *Oreochromis spilurus*.

Poelen et al. (2014) lists *Acanthogyrus tilapiae*, *Ophiovalipora minuta*, *Scutogyrus longicornis*, *Anacanthorus colombianus*, *Cichlidogyrus aegypticus*, *C. arthracanthus*, *C. bychowskii*, *C. dionchus*, *C. halli*, *C. cirratus*, *C. sclerosus*, *C. tiberianus*, *C. tilapiae*, *C. tubicirrus*, and *Gyrodactylus cichlidarum* as parasites of *Oreochromis spilurus*.

Threat to Humans

From Froese and Pauly (2020):

“Harmless”

3 Impacts of Introductions

No records of impacts from *Oreochromis spilurus* introductions were found.

O. spilurus is listed as a prohibited species in Florida (FFWCC 2020).

4 History of Invasiveness

Many records of introduction were found for *Oreochromis spilurus*. It is listed as established in Kuwait, Democratic Republic of the Congo, and Saudi Arabia, and probably established in Uganda, Philippines, and United Arab Emirates. It was introduced to Madagascar but did not establish a population. Records of introduction were found nine additional countries but without information on establishment. No records of impacts from introductions were found so the history of invasiveness is Data Deficient.

5 Global Distribution

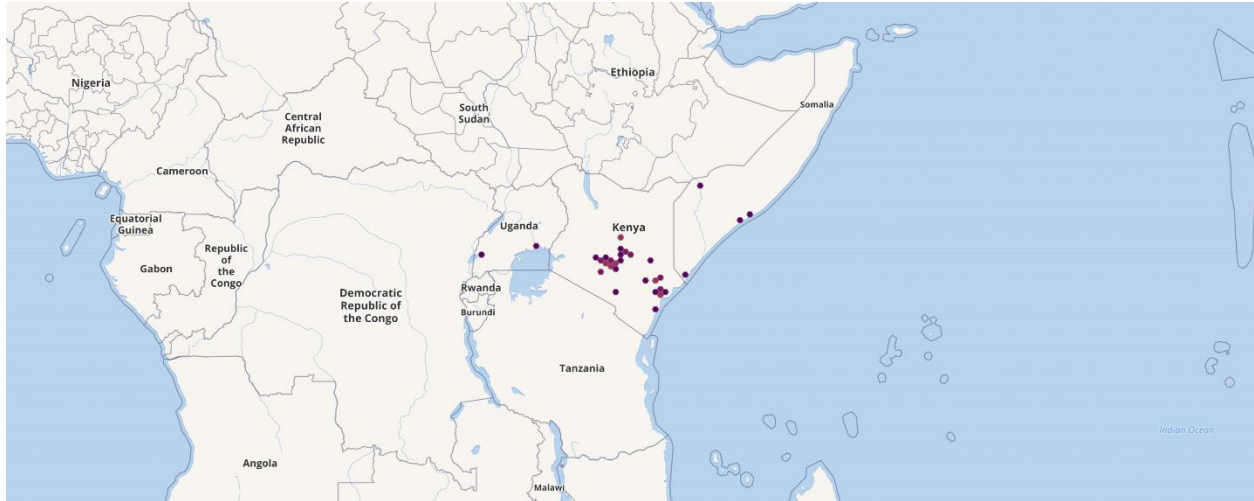


Figure 1. Known global distribution of *Oreochromis spilurus*. Locations are in Somalia, Kenya, and Uganda. Map from GBIF Secretariat (2020).

According to Froese and Pauly (2020), *Oreochromis spilurus* is also native to Ethiopia and has established or probably established introduced populations in Kuwait, Democratic Republic of the Congo, Saudi Arabia, Philippines, and United Arab Emirates; however, no specific location information was given therefore those locations could not be used to select source points for the climate match.

6 Distribution Within the United States

No records of *Oreochromis spilurus* occurrences in the United States were found.

7 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Oreochromis spilurus* was low for most of the contiguous United States with small patches of medium match in southern Florida, southern Texas, along the southern west coast of California, and around Puget Sound. The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.001, low (scores between 0.000 and 0.005, inclusive, are classified as low). All States had a low individual climate score, except for Florida, which had a medium score.

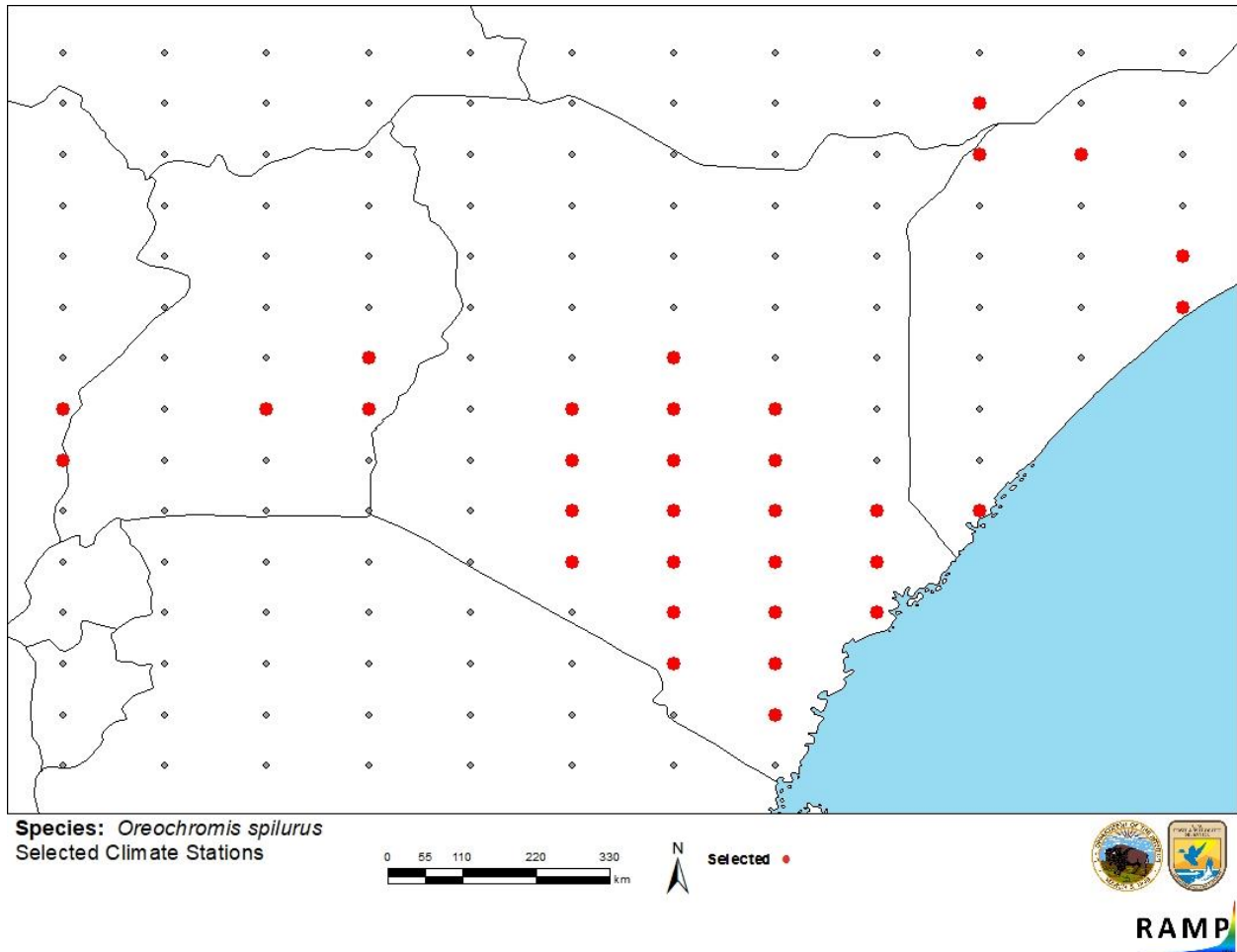


Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in eastern Africa selected as source locations (red; Ethiopia, Somalia, Kenya, Uganda, and Democratic Republic of the Congo) and non-source locations (gray) for *Oreochromis spilurus* climate matching. Source locations from GBIF Secretariat (2020). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

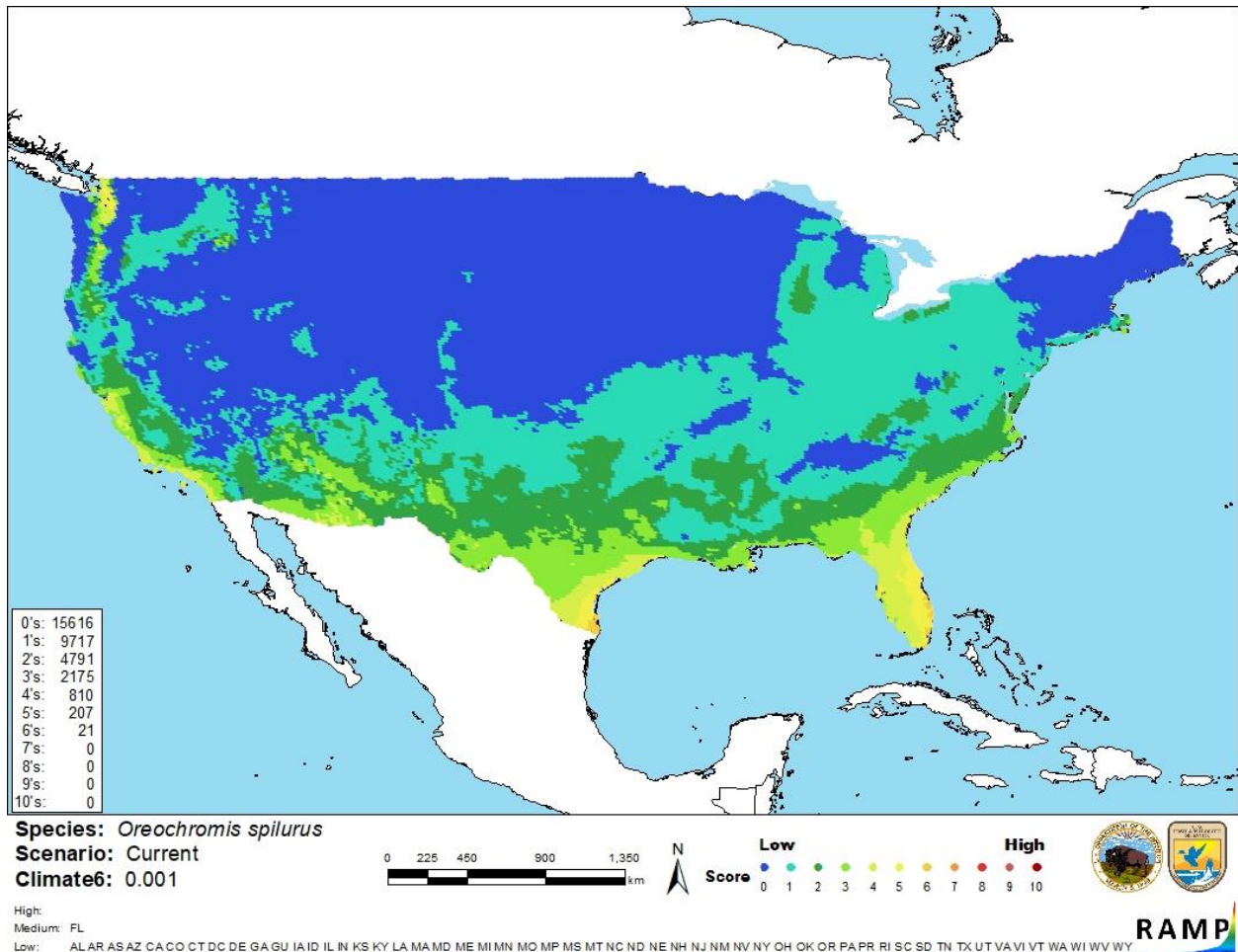


Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *Oreochromis spilurus* in the contiguous United States based on source locations reported by GBIF Secretariat (2020). Counts of climate match scores are tabulated on the left. 0/Blue = Lowest match, 10/Red = Highest match.

The High, Medium, and Low Climate match Categories are based on the following table:

Climate 6: (Count of target points with climate scores 6-10)/ (Count of all target points)	Overall Climate Match Category
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
≥ 0.103	High

8 Certainty of Assessment

The certainty of this assessment is low. Georeferenced observations were not available for parts of the native and nonnative ranges of the species. No records of impacts from the introductions was found.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Sabaki Tilapia (*Oreochromis spilurus*) is a fish native to Ethiopia, Kenya, and Somalia in east Africa. This species is widely used in aquaculture, it can be raised in brackish water as well as freshwater. *O. spilurus* is listed as a prohibited species in Florida. The history of invasiveness is data deficient. Froese and Pauly (2020) reports *O. spilurus* introductions in that resulted in either established or probably established populations in six countries in the Middle East and Africa and introduced in an additional nine countries in those regions. The climate match analysis resulted in a low match for the contiguous United States. Small areas of medium match were found in southern Florida and Texas, as well as in patches along the West Coast. The certainty of this assessment is low due to lack of information. The overall risk assessment category is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 4): Data Deficient**
- **Overall Climate Match Category (Sec. 7): Low**
- **Certainty of Assessment (Sec. 8): Low**
- **Remarks/Important additional information:** No additional remarks
- **Overall Risk Assessment Category: Uncertain**

10 Literature Cited

Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 11.

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11 Literature Cited in Quoted Material

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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