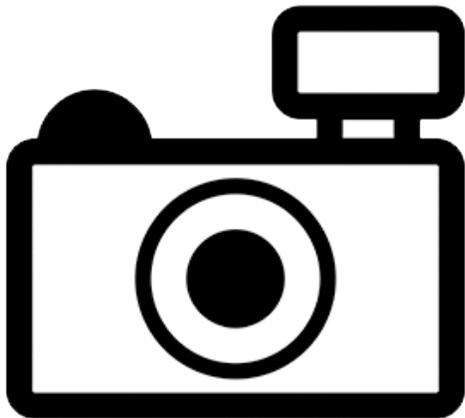


# ***Sarotherodon occidentalis* (a tilapia, no common name)**

## **Ecological Risk Screening Summary**

U.S. Fish & Wildlife Service, May 2012  
Revised, September 2018  
Web Version, 8/19/2019



No Photo Available

## **1 Native Range and Status in the United States**

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### **Native Range**

From Froese and Pauly (2018):

“Africa: coastal areas from the Casamance River (Senegal) to the Saint John River (Liberia) [Teugels and Thys van den Audenaerde 2003].”

“[In Guinea:] Occurs in the Kogon, Konkouré, Great Scarcies [Paugy et al. 1994; Teugels and Thys van den Audenaerde 2003], and Corubal rivers [Teugels and Thys van den Audenaerde 2003].”

“[In Guinea-Bissau:] Occurs in the Corubal River [Paugy et al. 1994].”

“[In Liberia:] Occurs in the Loffa, St. Paul [Paugy et al. 1994] and St. John rivers [Paugy et al. 1994; Teugels and Thys van den Audenaerde 2003].”

“[In Senegal:] Occurs in the Casamance River [Paugy et al. 1994; Teugels and Thys van den Audenaerde 2003].”

“[In Sierra Leone:] Occurs in the Little Scarcies, Jong, Rokel and Sewa rivers [Paugy et al. 1994].”

## Status in the United States

No records of *Sarotherodon occidentalis* in the wild or in trade in the United States were found.

The Florida Fish and Wildlife Conservation Commission has listed the tilapia *Sarotherodon occidentalis* as a prohibited species. Prohibited nonnative species (FFWCC 2018), “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 *Sarotherodon occidentalis* in the wild in the United States were found.

## Remarks

From Froese and Pauly (2018):

“Near Threatened (NT)”

Information searches for this ERSS were conducted using the valid name *Sarotherodon occidentalis* and a synonym, *Tilapia occidentalis* (Fricke et al. 2018).

## 2 Biology and Ecology

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### Taxonomic Hierarchy and Taxonomic Standing

From Fricke et al. (2018):

“**Current status:** Valid as *Sarotherodon occidentalis* (Daget 1962).”

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 *Sarotherodon*  
Species *Sarotherodon occidentalis* (Daget, 1962)”

## **Size, Weight, and Age Range**

From Froese and Pauly (2018):

“Max length : 28.3 cm SL male/unsexed; [Teugels and Thys van den Audenaerde 1992]”

## **Environment**

From Froese and Pauly (2018):

“Freshwater; demersal. [...]; 24°C - 26°C [assumed to be recommended aquarium temperature range] [Baensch and Riehl 1997]”

## **Climate/Range**

From Froese and Pauly (2018):

“Tropical; [...]”

## **Distribution Outside the United States**

Native

From Froese and Pauly (2018):

“Africa: coastal areas from the Casamance River (Senegal) to the Saint John River (Liberia) [Teugels and Thys van den Audenaerde 2003].”

“[In Guinea:] Occurs in the Kogon, Konkouré, Great Scarcies [Paugy et al. 1994; Teugels and Thys van den Audenaerde 2003], and Corubal rivers [Teugels and Thys van den Audenaerde 2003].”

“[In Guinea-Bissau:] Occurs in the Corubal River [Paugy et al. 1994].”

“[In Liberia:] Occurs in the Loffa, St. Paul [Paugy et al. 1994] and St. John rivers [Paugy et al. 1994; Teugels and Thys van den Audenaerde 2003].”

“[In Senegal:] Occurs in the Casamance River [Paugy et al. 1994; Teugels and Thys van den Audenaerde 2003].”

“[In Sierra Leone:] Occurs in the Little Scarcies, Jong, Rokel and Sewa rivers [Paugy et al. 1994].”

## Introduced

Froese and Pauly (2018) lists *Sarotherodon occidentalis* as introduced to New Caledonia and Vanuatu.

From Froese and Pauly (2018):

“[In New Caledonia:] Mostly in the creeks in slow waters where it can occur in large numbers [Marquet et al. 2003].”

## Means of Introduction Outside the United States

From Eldredge (2000):

“New Caledonia—probably from the Philippines, for fishery (Gargominy et al. 1996; Seret 1997)”

## Short Description

From Froese and Pauly (2018):

“Dorsal spines (total): 16 - 18; Dorsal soft rays (total): 12-13; Anal spines: 3; Anal soft rays: 10 - 11. Diagnosis: 29-31 total dorsal-fin rays; upper profile of snout strongly arched; head length 31.0-35.0% SL; 30-32 lateral line scales [Teugels and Thys van den Audenaerde 2003]. 2 complete rows of scales on cheek [Trewavas 1983; Teugels and Thys van den Audenaerde 2003]. Toothed area of lower pharyngeal bone with concave sides; snout and cheek purple; iris orange; nape and upper part of body soiled yellowish; posterior dorsal lappets and upper edge of soft dorsal watery pink; few vague dark spots on soft dorsal and center of caudal; pelvic ending in short white filament [Trewavas 1983].”

“Coloration: young individuals with 7 distinct cross bars on sides and large round "tilapian" spot bordered anteriorly and posteriorly by light-coloured area; cross bars disappear in adults, but "tilapian" spot remains [Teugels and Thys van den Audenaerde 2003]. Snout and cheeks purple, nape and back yellowish [Teugels and Thys van den Audenaerde 2003; Lamboj 2004], fading to white on lower sides and belly [Teugels and Thys van den Audenaerde 2003]. Lower lip, lower jaw, preopercle and throat white; posterior area and distal margin of soft part of dorsal fin pink; some black spots on soft part of dorsal and on centre of caudal fin [Teugels and Thys van den Audenaerde 2003].”

## Biology

From Froese and Pauly (2018):

“Oviparous [Breder and Rosen 1966]. Ovophilic; mouthbrooder, possibly the male incubates the eggs [Lamboj 2004].”

“Females employ mouthbrooding to care for the young [Noakes and Balon 1982].”

From Payne (2018):

“Amongst the other species of *Sarotherodon*, *S. occidentalis* takes a wide variety of algae including pennate diatoms augmented in the dry season with some detrital and higher plant fragments. Sand grains are common in the stomach content perhaps showing some grazing over the sand surface. During the dry season, plankton tows showed that the river phytoplankton was dominated by green algae with the desmid *Cosmarium* and a colonial green being the most abundant, along with a variety of pennate diatoms as well as some filaments of cyanobacteria. When using a mid-water gill net in a flooded quarry near Port Loko the most abundant species taken was *S. occidentalis* implying that this species could be a midwater phytoplankton feeder like *S. galilaeus* (Trewavas 1983).”

## Human Uses

From Bousso and Lalèyè (2010):

“This species is harvested for human consumption.”

The Florida Fish and Wildlife Conservation Commission has listed the tilapia *Sarotherodon occidentalis* as a prohibited species. Prohibited nonnative species (FFWCC 2018), “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.”

## Diseases

**No records of OIE-reportable diseases (OIE 2019) were found for *Sarotherodon occidentalis*.**

Pariselle and Euzet (1997) list *Sarotherodon occidentalis* as a host for *Cichlidogyrus bouvii*, *C. fontanai*, *C. guirali*, *C. halli*, *C. paganoi*, and *C. sanjeani*.

Additionally, le Roux and Avenant-Oldewage (2010) list *Sarotherodon occidentalis* as a host for *Scutogyrus ecoutini*.

## Threat to Humans

From Froese and Pauly (2018):

“Harmless”

## 3 Impacts of Introductions

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From Keith (2002):

“The introduction of two tilapia species (*Oreochromis mossambicus* and *Sarotherodon occidentalis*) in 1955, followed by that of the largemouth bass, *Micropterus salmoides* in 1960, has led to a decrease in numbers [of *Galaxias neocaledonicus*, a native fish]. These introduced

species preyed on the different stages of *G. neocaledonicus* [a critically endangered fish endemic to New Caledonia].”

## 4 Global Distribution

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**Figure 1.** Map of coastal Western Africa showing locations where *Sarotherodon occidentalis* has been reported. Map from GBIF Secretariat (2018).

The map in Figure 1 does not include locations on the island of New Caledonia where *Sarotherodon occidentalis* has established populations after introduction (Froese and Pauly 2018). New Caledonia is located to the northeast of Australia. The few climate source points on New Caledonia were used in the climate match to represent these established populations.

## 5 Distribution Within the United States

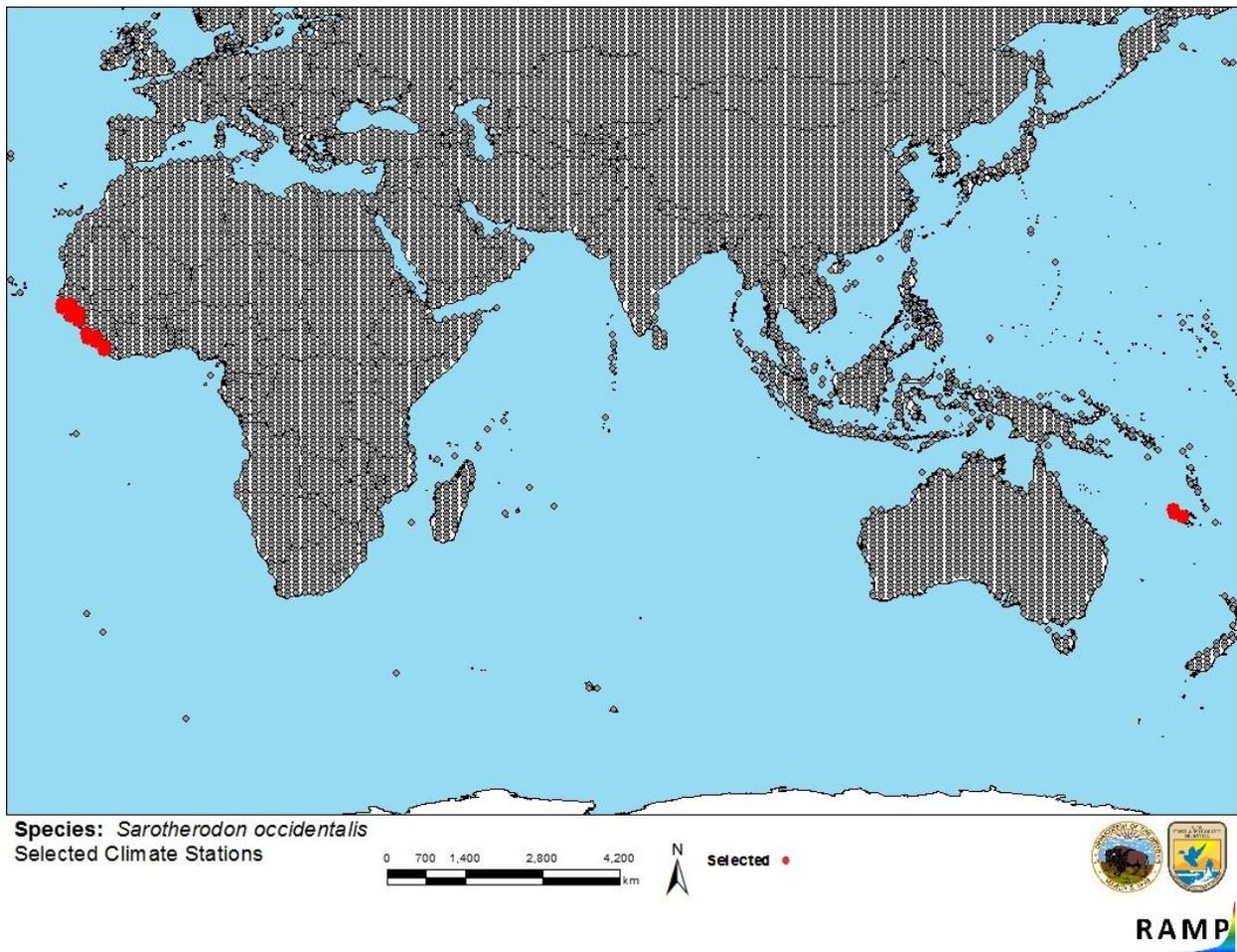
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No records of *Sarotherodon occidentalis* in the wild in the United States were found.

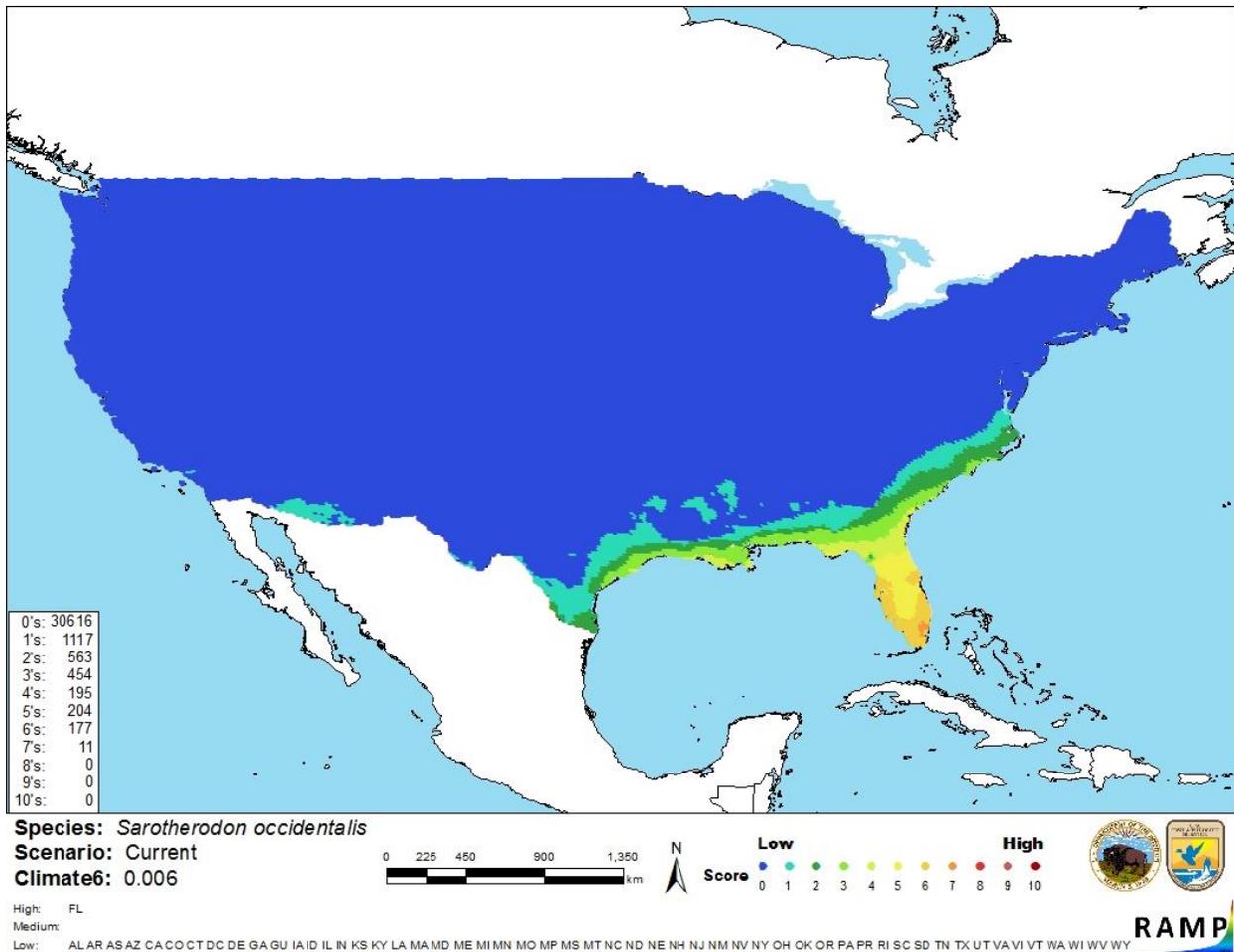
## 6 Climate Matching

### Summary of Climate Matching Analysis

The climate match for *Sarotherodon occidentalis* was low across most of the contiguous United States. There were areas of medium match along the southern Atlantic Coast and along the Gulf Coast. Most of Florida had a medium match however the southern areas of the state had a high match. The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.006, medium (scores greater than 0.005, but less than 0.103, are classified as medium). All States except for Florida had low individual Climate 6 scores; Florida had a high individual score.



**Figure 2.** RAMP (Sanders et al. 2018) source map showing weather stations in coastal Western Africa selected as source locations (red; Gambia, Senegal, Guinea-Bissau; Guinea, Sierra Leone, Liberia, New Caledonia) and non-source locations (gray) for *Sarotherodon occidentalis* climate matching. Source locations from Froese and Pauly (2018) and GBIF Secretariat (2018). 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 *Sarotherodon occidentalis* in the contiguous United States based on source locations reported from Froese and Pauly (2018) and GBIF Secretariat (2018). Counts of climate match scores are tabulated on the left. 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
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
$\geq 0.103$	High

## 7 Certainty of Assessment

The certainty of assessment is low. There was some general information about the species available from peer-reviewed sources. Two records of introduction were found. One could be verified to have resulted in established populations. Information on a potential impact was available from a peer-review source but the information was not of the quality needed to support a higher certainty of assessment.

## 8 Risk Assessment

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### Summary of Risk to the Contiguous United States

*Sarotherodon occidentalis* is a species of tilapia native to coastal rivers of Western Africa. This species is harvested for human consumption. The history of invasiveness is None Documented. *S. occidentalis* was introduced to New Caledonia where it has become established. There is a possibility that it may have had an impact on a native species of fish. However, the available information is not clear on the role of *S. occidentalis* in the decline of the native species or if the decline is more due to other invasive species or environmental degradation. The overall climate match for the contiguous United States was medium. Southern Florida did have areas of high match and the individual climate score for that State was high. All other States had low individual climate matches. The certainty of assessment is low. The overall risk assessment is uncertain.

### Assessment Elements

- **History of Invasiveness (Sec. 3): None Documented**
- **Climate Match (Sec. 6): Medium**
- **Certainty of Assessment (Sec. 7): Low**
- **Remarks/Important additional information:** No additional information.
- **Overall Risk Assessment Category: Uncertain**

## 9 References

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**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

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**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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