

Golden Mbuna (*Melanochromis auratus*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, February 2011
Revised, June 2019
Web Version, 5/1/2020

Organism Type: Fish
Overall Risk Assessment Category: Uncertain



Photo: Vlad Butsky. Licensed under CC-BY-2.0. Available:
[https://commons.wikimedia.org/wiki/File:Melanochromis_auratus_\(female\).jpg](https://commons.wikimedia.org/wiki/File:Melanochromis_auratus_(female).jpg). (May 2019).

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2019):

“Africa: endemic to Lake Malawi [Malawi] [Maréchal 1991; Konings and Stauffer 2012].”

From Konings and Kasembe (2018):

“Endemic to Lake Malawi this species mainly occurs in the southern part of the lake, from Jalo reef along the entire western coast, down to Crocodile rocks, including all islands and reefs with the exception of Zimbabwe Rock, and Chinyankwazi and Boadzulu islands.”

Status in the United States

From Froese and Pauly (2019):

“This species is listed as reported but not established in Rogers Spring near Lake Mead, Clark County, Nevada.”

According to Nico (2019), *Melanochromis auratus* has been reported in Tampa, Florida, where the population status is unknown.

From Nico (2019):

“The species is common in the aquarium trade.”

From The iFish Store (2020):

“African Cichlid | Auratus Cichlid
\$5.99 Sale
[...]
Scientific Name: *Melanochromis auratus*”

Means of Introductions in the United States

From Nico (2019):

“**Means of Introduction:** Probable aquarium release.”

From Avery et al (1999):

“Four varieties of cichlid (750 each) were stocked in one pond [in central Florida]: *Melanochromis auratus*, *M. chipokae*, *Haplochromis venustus*, and *H. redempres*.”

Remarks

No additional remarks.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From Fricke et al (2019):

“**Current status:** Valid as *Melanochromis auratus* (Boulenger 1897).”

From ITIS (2019):

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 *Melanochromis*

Species *Melanochromis auratus* (Boulenger, 1897)

Size, Weight, and Age Range

From Froese and Pauly (2019):

“Max length : 11.0 cm TL male/unsexed; [Maréchal 1991]”

From Konings and Kasembe (2018):

“Maximum size 10 cm for males and 9 cm for females.”

Environment

From Froese and Pauly (2019):

“Freshwater; demersal; pH range: 7.0 - 8.5; dH range: 10 - 15. [...] 22°C - 26°C [Riehl and Baensch 1991; assumed to be recommended aquarium temperature] [...]”

From Konings and Kasembe (2018):

“Recorded from the surface to a depth of at least 40 m, but is more numerous in the upper 10 m.”

Climate

From Froese and Pauly (2019):

“Tropical; [...] 12°S - 15°S”

Distribution Outside the United States

Native

From Froese and Pauly (2019):

“Africa: endemic to Lake Malawi [Malawi] [Maréchal 1991, Konings and Stauffer 2012].”

From Konings and Kasembe (2018):

“Endemic to Lake Malawi this species mainly occurs in the southern part of the lake, from Jalo reef along the entire western coast, down to Crocodile rocks, including all islands and reefs with the exception of Zimbabwe Rock, and Chinyankwazi and Boadzulu islands.”

Introduced

Froese and Pauly (2019) report *Melanochromis auratus* as introduced to Israel. The population is sustained by continuous restocking and is not an established self-sustaining population.

Means of Introduction Outside the United States

No information on the means of introduction have been reported.

Short Description

From Nico (2019):

“Males are predominantly blue and black; females are gold and black (Ribbink et al. (1983).”

“Females and breeding or territorial males have very different color patterns (Ribbink et al. 1983; Lewis et al. 1986).”

Biology

From Froese and Pauly (2019):

“Found in rocky habitats. Feeds from the biocover by nibbling and picking on the algae [Konings 1990].”

“Lays up to 40 eggs. Female takes brood into her mouth and takes care of the young.”

From Konings and Kasembe (2018):

“Occurs mainly in rocky habitat, mostly numerous among medium sized rocks but can also occur in intermediate habitat. [...] Males are weakly territorial and seldom stay to defend a particular site for more than a few hours, while females and non-territorial males occur singly or in small groups of about 8–10 individuals. Spawning occurs inside a cave or alongside a rock and it feeds on aufwuchs, as well as plankton.”

Human Uses

From Froese and Pauly (2019):

“Aquarium: highly commercial”

From Patoka et al (2018):

“In Indonesia, the Regulation No. 41/PERMEN-KP/2014 bans the import of selected 152 non-native fish species. In this law, fishes are defined as “all types of organism in which all or part of its life cycle is in an aquatic environment”. Paradoxically, many banned species such as *P. clarkii*, Midas cichlid (*A. citrinellus*), and the auratus cichlid (*Melanochromis auratus*) are cultured and produced in Indonesia in huge quantities because it is legal to release non-native species into the wild and indeed, local people do so for further exploiting.”

From Nico (2019):

“The species is common in the aquarium trade [in the United States].”

From The iFish Store (2020):

“African Cichlid | Auratus Cichlid
\$5.99 Sale
[...]
Scientific Name: *Melanochromis auratus*”

Diseases

From Froese and Pauly (2019):

“Fin-rot Disease (late stage), Bacterial diseases
White spot Disease, Parasitic infestations (protozoa, worms, etc.)
Fin Rot (early stage), Bacterial diseases
Trypanosoma Infection, Parasitic infestations (protozoa, worms, etc.)
Cryptobia Infestation, Parasitic infestations (protozoa, worms, etc.)
Hole-in-the-Head Disease, Parasitic infestations (protozoa, worms, etc.)
Pseudomonas infection, Bacterial diseases
Bacterial Infections (general), Bacterial diseases”

Poelen et al (2014) lists the following parasites for *Melanochromis auratus*: *epistylus colisarum*, *gyrodactylus chichlidarum*, *acanthogyrus tilapiae*, *goezia sinamora*, and *neobenedenia melleni*.

Threat to Humans

From Froese and Pauly (2019):

“Harmless”

3 Impacts of Introductions

From Nico (2019):

“**Impact of Introduction:** The impacts of this species are currently unknown, as no studies have been done to determine how it has affected ecosystems in the invaded range. The absence of data does not equate to lack of effects. It does, however, mean that research is required to evaluate effects before conclusions can be made.”

4 History of Invasiveness

The history of invasiveness is Data Deficient. *Melanochromis auratus* has been reported in Florida and Nevada, but the populations did not become established. *M. auratus* is reported as present in the wild in Israel due to continuous restocking yet no information on impacts of introduction have been reported. Froese and Pauly (2019) report this species as “highly commercial” but no data were found to quantify the volume of trade in this species in the United States or worldwide.

5 Global Distribution



Figure 1. Known global distribution of *Melanochromis auratus*. Observations are reported from southeastern Africa and North America. Map from GBIF Secretariat (2019). Locations in the United States do not represent established populations and will not be used to select source locations in the climate match. No georeferenced points were available for Israel, since that is not a self-sustaining population any points would not have been used to select source locations for the climate match.

6 Distribution Within the United States



Figure 2. Known distribution of *Melanochromis auratus* in the United States in Nevada and Florida. Map from Nico (2019). Locations do not represent established populations and will not be used in the climate match.

7 Climate Matching

Summary of Climate Matching Analysis

The climate match for the contiguous United States was generally very low. Small patches of medium match are found along the southern border. The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.000, a low score. (Scores of 0.005 and below are classified as low.) All States individually received low climate scores.

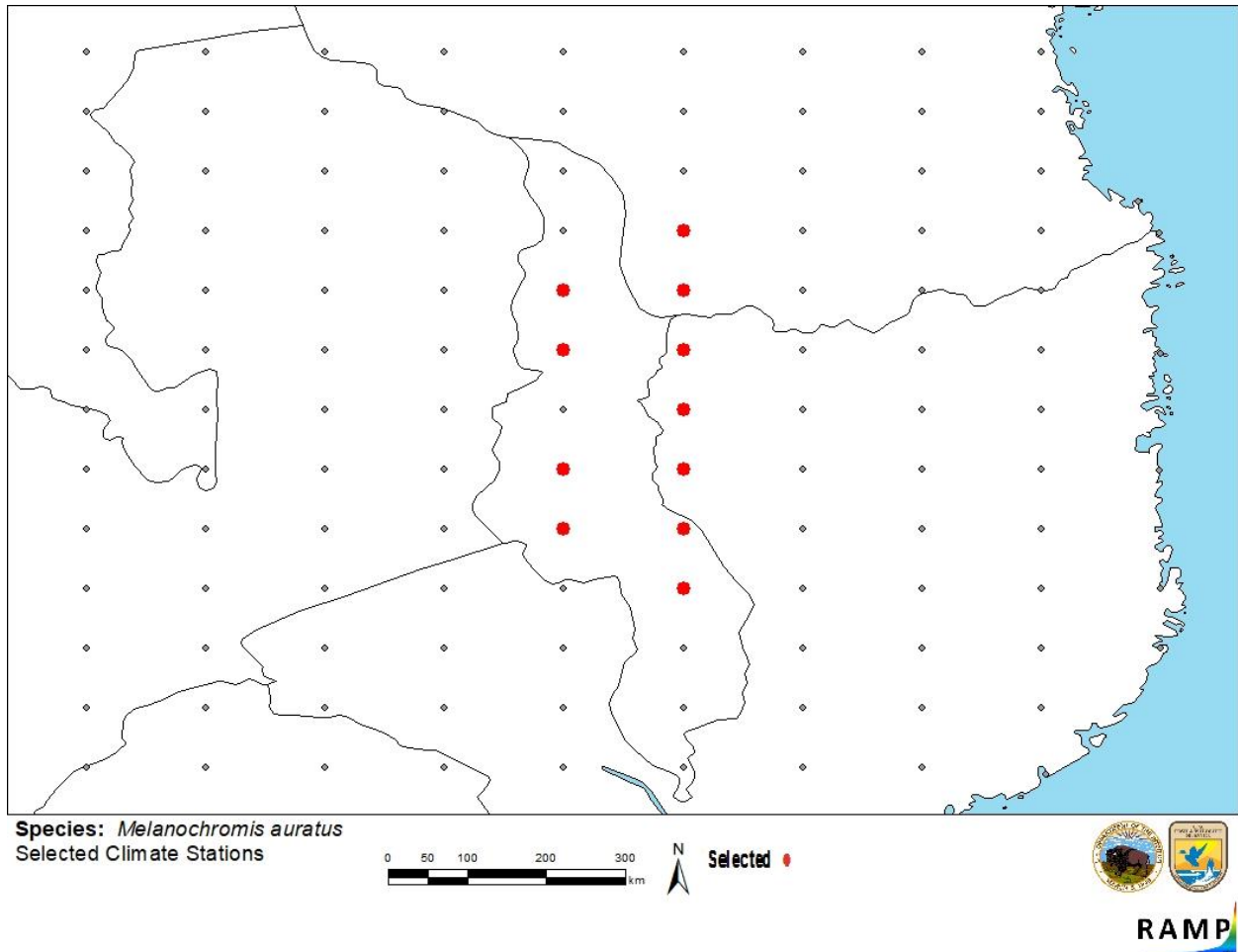


Figure 3. RAMP (Sanders et al. 2018) source map showing weather stations in southeastern Africa selected as source locations (red; Malawi, Mozambique, and Tanzania) and non-source locations (gray) for *Melanochromis auratus* climate matching. Source locations from GBIF Secretariat (2019). Selected source locations are within 100 km of one or more species occurrences and do not necessarily represent the locations of occurrences themselves.

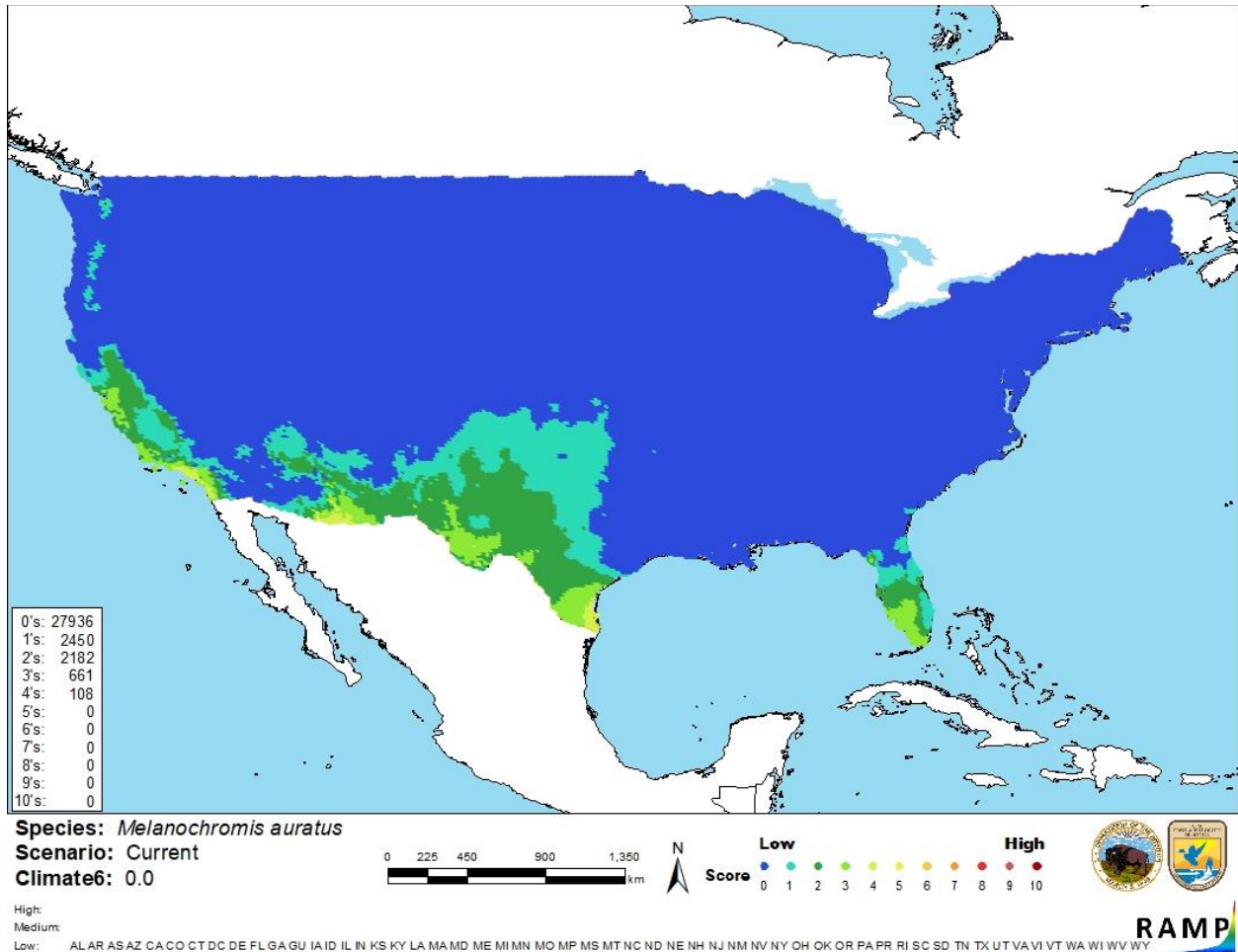


Figure 4. Map of RAMP (Sanders et al. 2018) climate matches for *Melanochromis auratus* in the contiguous United States based on source locations reported by GBIF Secretariat (2019). Counts of climate match scores are tabulated on the left. 0/Blue = Lowest match, 10/Red = Highest match.

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

Certainty of assessment is low for *Melanochromis auratus*. Limited information is available on this species. There is some biological and ecological information. It has been reported as introduced in the United States and Israel but no information has been reported on impacts of introduction. There was no information on trade volume found.

9 Risk Assessment

Summary of Risk to the Contiguous United States

The golden mbuna, *Melanochromis auratus*, is a tropical cichlid (fish) endemic to Lake Malawi in Malawi. This species is reported as highly commercialized in the aquarium trade, but supporting data was not found. The history of invasiveness is Data Deficient. *M. auratus* has been reported in Florida and Nevada, but the populations did not become established. *M. auratus* is reported as introduced in Israel but the population is sustained by continuous restocking and not natural reproduction. No information on impacts of introduction have been reported. The climate match for the contiguous United States is low. All States received low individual climate scores. The certainty of assessment is low. The overall risk assessment category for *Melanochromis auratus* 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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Fricke R, Eschmeyer WN, van der Laan R, editors. 2019. Eschmeyer’s catalog of fishes: genera, species, references. Available: <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp> (May 2019).

Froese R, Pauly D, editors. 2019. *Melanochromis auratus* (Boulenger, 1897). FishBase. Available: <https://www.fishbase.de/summary/Melanochromis-auratus.html> (May 2019).

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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.

- Konings A. 1990. Ad Konings's book of cichlids and all the other fishes of Lake Malawi. T.F.H. Publications.
- Konings AF, Stauffer JR Jr. 2012. Review of the Lake Malawi genus *Melanochromis* (Teleostei: Cichlidae) with a description of a new species. *Zootaxa* 3258:1–27.
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