

Blue Mbuna (*Labeotropheus fuelleborni*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, February 2011
Revised, July 2019
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1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2019):

“Africa: widely distributed in Lake Malawi [Malawi, Mozambique, Tanzania], including offshore islands [Marechal 1991; Konings 1995].”

Status in the United States

According to Nagy (2019) *Labeotropheus fuelleborni* is established at Pinecrest Gardens in Miami-Dade County, Florida. However, Schofield et al. (2019) report this population has been successfully eradicated.

From Schofield et al. (2019):

“Herein we report a multi-agency effort to eradicate two non-native cichlid fishes in Miami, Florida (Bay Snook *Petenia splendida* and Blue Mbuna *Labeotropheus fuelleborni*). These fishes were removed before they were observed in the extensive, interconnected canal system through which they may have been able to expand throughout south Florida and access protected areas such as Everglades National Park. The study site, Pinecrest Gardens, is important because it contains remnant coastal cypress-strand habitat in an increasingly urbanized landscape that historically provided refuge to native amphidromous fishes and invertebrates. The project took considerable time (3.5 years), and we detail in this report how it evolved from a focus on isolating the non-native fishes and reducing their population sizes to an eradication. Gardens’ staff hydrologically isolated their ponds from nearby waterbodies by plugging a culvert with a solid gate.”

From Nagy (2019):

“Fish collected as part of "Fish Slam 2016". Forty-four fish were sent to the Florida Museum of Natural History as voucher specimens.”

The species is in trade in the United States. Goliad Farms (2019) reports “*Labeotropheus fuelleborni* ‘Blue Marmalade’ \$16.00 – \$24.00” Numerous other websites offer the fish for sale.

Means of Introductions in the United States

From Nagy (2019):

“released aquarium”

Remarks

From Konings and Kazembe (2018):

“Sedimentation, extraction for the ornamental fish trade, and subsistence fishing are threats to this species [in its native range].”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From Fricke et al. (2019):

“**Current Status:** Valid as *Labeotropheus fuelleborni* (Ahl, 1926).”

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 *Labeotropheus*

Species *Labeotropheus fuelleborni* (Ahl, 1926)

Size, Weight, and Age Range

From Froese and Pauly (2019):

“Max length : 30.0 cm SL male/unsexed; [Jackson 1961]; 8.7 cm SL (female)”

Environment

From Froese and Pauly (2019):

“Freshwater; benthopelagic; pH range: 7.5 - 8.5; dH range: ? - 12; depth range 1 - 6 m. [...] 22°C - 25°C [Riehl and Baensch 1991] [assumed to be recommended aquarium temperature];”

Climate/Range

From Froese and Pauly (2019):

“Tropical; [...] 9°S - 15°S”

Distribution Outside the United States

Native

From Froese and Pauly (2019):

Africa: widely distributed in Lake Malawi [Malawi, Mozambique, Tanzania], including offshore islands [Marechal 1991; Konings 1995].

Introduced

According to Froese and Pauly (2019) *Labeotropheus fuelleborni* has been introduced and became established in Israel.

Means of Introduction Outside the United States

From Froese and Pauly (2019):

“ornamental”

“continuous restocking”

Short Description

No description of the species was found.

Biology

From Froese and Pauly (2019):

“Is territorial over rocky substrate [Ribbink 1990]. Usually feeds alone, or in small groups with other species, on the Aufwuchs cover on rocks in shallow water [Ribbink 1990]. Occasionally, however, members band and form feeding schools of several hundred fish which raid the rich algal gardens of other species. Also feeds on worms, crustaceans, insects and plant matter [Mills and Vevers 1989].”

“Female takes brood into her mouth and takes care of the young.”

From Konings and Kazembe (2018):

“*Labeotropheus fuelleborni* is restricted to the wave-washed upper rocky habitat. It is also found on small patches of rocks amidst sandy beaches, especially at wave-exposed sites. It feeds on algae which are tightly attached to the rocks. Its ventral position allows it to feed in a position almost parallel to the rocks, its body making an angle of approximately 30° with the substrate. It thus remains in close contact with the substrate while cropping algae. Both nose and chin are callused (dermal thickening), probably as a result of continuous contact with rough substrates during feeding. The effect of the fish closing its mouth on the firmly attached filamentous algae is to pull it closer to the substrate, and the nose then functions as a fulcrum, allowing its owner to shear off the algae by leverage rather than energy-consuming jerking of the body. This not only saves energy but also allows it to remain in close contact with the rocks, thus reducing the risk of being swept away by the turbulent water. This feeding method efficiently removes the algae completely, leaving visible scrape marks on the rocks. Males defend their territories with great vigor, especially against conspecific males. Females and non-territorial males congregate in groups and feed from the upper parts of the habitat. Spawning takes place in the male's cave. The fry, which are released for the first time after three weeks, find refuge inside the female's mouth for at least another week.”

Human Uses

From Froese and Pauly (2019):

“Fisheries: commercial; aquarium: commercial”

From Konings and Kazembe (2018):

“It is regularly collected by the ornamental fish trade where it is known by its scientific name. Like all Malawi cichlids of any size, *L. fuelleborni* is a food fish but rarely caught by subsistence fishermen and not specifically targeted.”

Diseases

No records of OIE-reportable diseases (OIE 2019) were found for *L. fuelleborni*.

Froese and Pauly (2019) report: 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.); Bacterial Infections (general), Bacterial diseases.

Threat to Humans

From Froese and Pauly (2019):

“Harmless”

3 Impacts of Introductions

Introductions were reported for Florida and Israel, but no information on impacts of introductions for this species were found.

4 Global Distribution



Figure 1. Known global distribution of *Labeotropheus fuelleborni*. Observations reported from Tanzania, Malawi, Mozambique, and Florida. Map from GBIF Secretariat (2019).

An established population in Israel is reported by Froese and Pauly (2019). However, the exact location of this population is unknown and therefore it could not be used to select source points for the climate match.

5 Distribution Within the United States

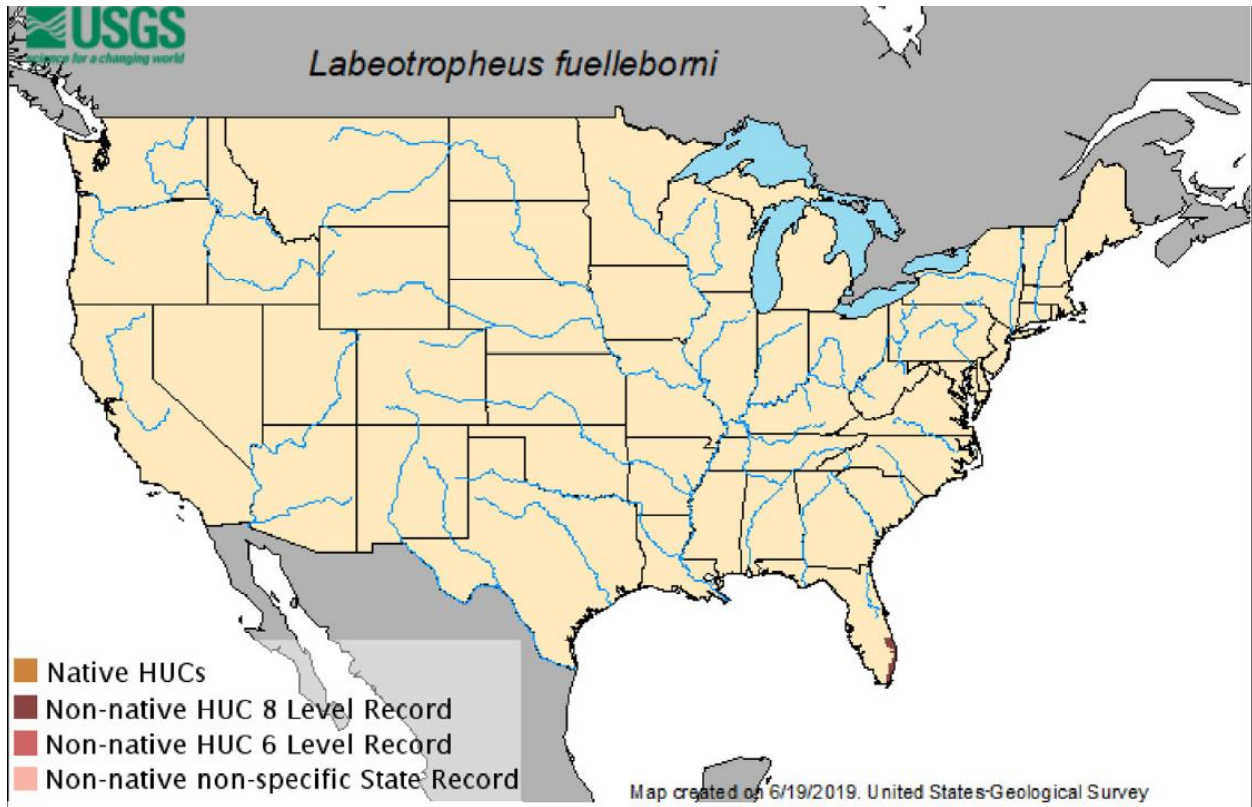


Figure 2. Known distribution of *Labeotropheus fuelleborni* in the United States. *L. buelleborni* was reported from a drainage in southeastern Florida. Map from Nagy (2019).

6 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Labeotropheus fuelleborni* was low for the majority of the contiguous United States with small patches of medium match along the southern border and areas of high match in southern Florida. The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.014, medium (scores greater than 0.005 but less than 0.103 are classified as medium). A majority of the States had low individual Climate 6 scores, except for Florida, which had a high individual score.

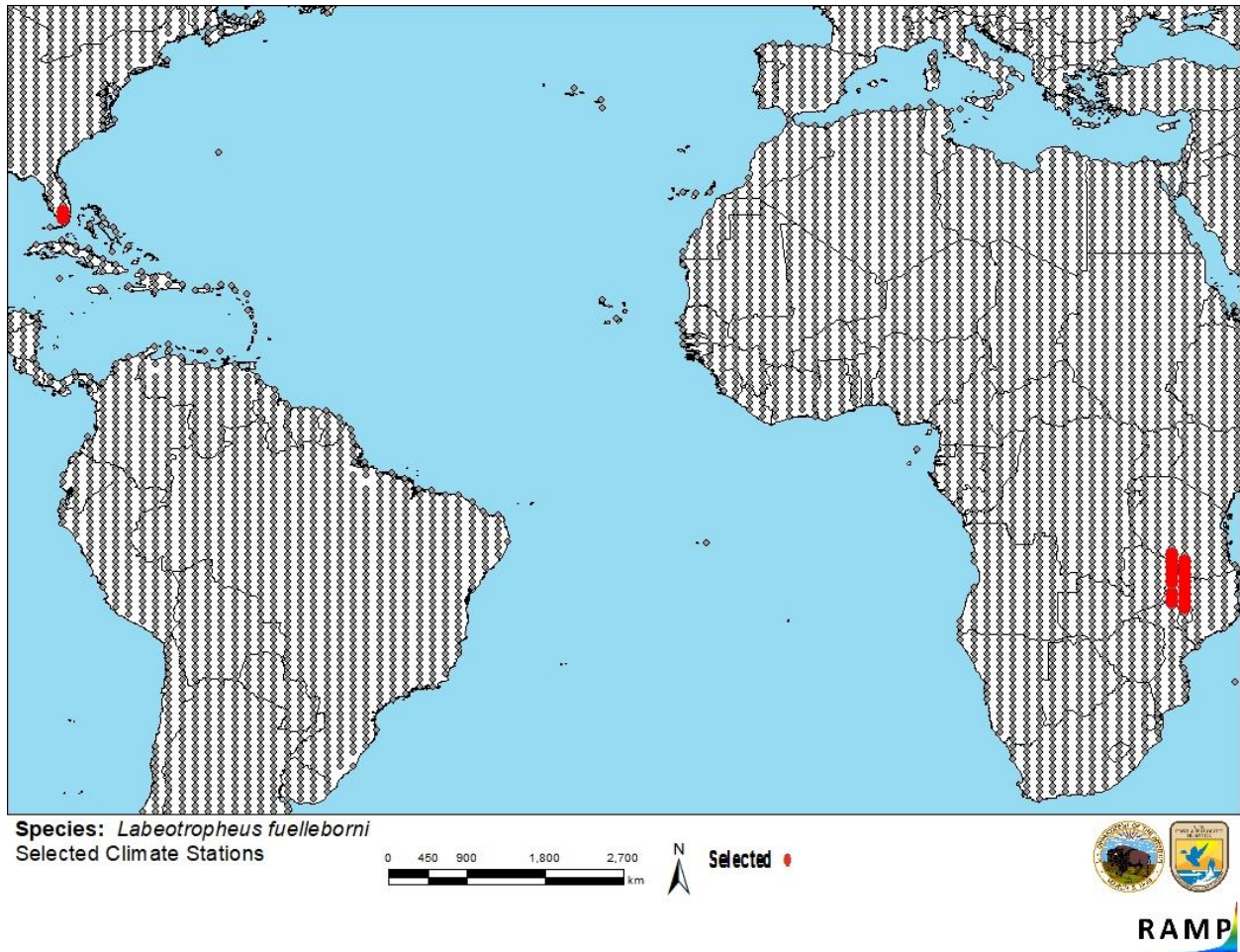


Figure 3. RAMP (Sanders et al. 2018) source map showing weather stations selected as source locations (red; Mozambique, Malawi, Tanzania, Zambia, Florida) and non-source locations (gray) for *Labeotropheus fuelleborni* climate matching. Source locations from GBIF Secretariat (2019). Selected source locations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

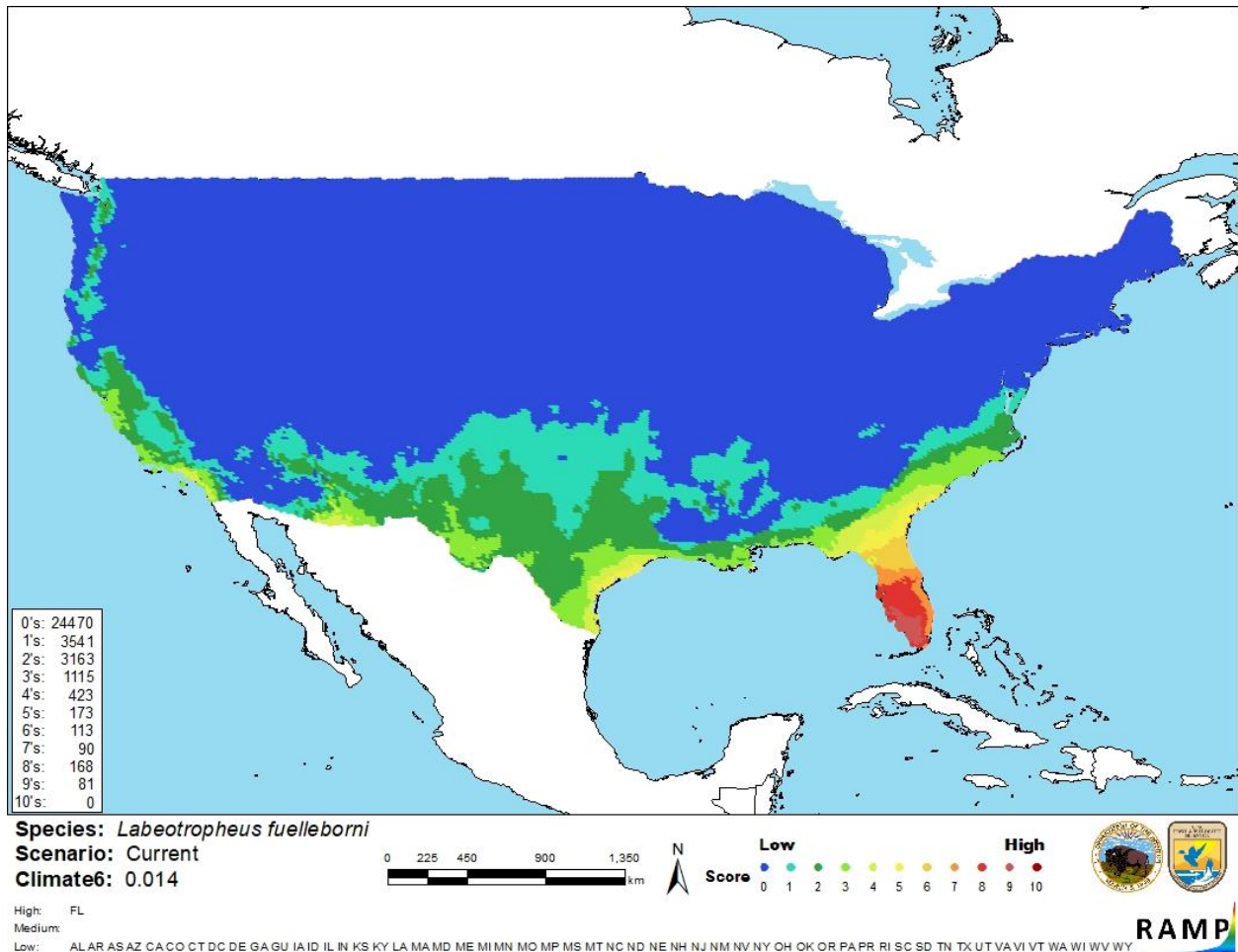


Figure 4. Map of RAMP (Sanders et al. 2018) climate matches for *Labeotropheus fuelleborni* in the contiguous United States based on source locations reported by GBIF Secretariat (2019). Counts of climate match scores are tabulated on the left. 0 = Lowest match, 10 = Highest match.

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
$0.000 \leq X < 0.005$	Low
$0.005 < X < 0.103$	Medium
$X \geq 0.103$	High

7 Certainty of Assessment

A relatively small amount of information is available on this species with some information available on its biology. No impacts are reported from the literature, in spite of the species being introduced and recorded as established in Florida and Israel. However, the climate match for the United States is medium. For these reasons, the certainty of the assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Blue Mbuna (*Labeotropheus fuelleborni*) is a freshwater African cichlid (fish) traded in the aquarium industry. Little information exists on the species, even though it has been recorded as being established in southern Florida and Israel. The Florida population was reported to be eradicated. Due to the lack of actual documented impacts of *Labeotropheus fuelleborni* the history of invasiveness of this species is None Documented. The climate match is medium. Most of the contiguous United States had a low climate match. Medium to high climate matches are found in southern Florida. The certainty of assessment is low due to a lack of information on introductions and impacts. The overall risk for this species 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 remarks.
- **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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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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