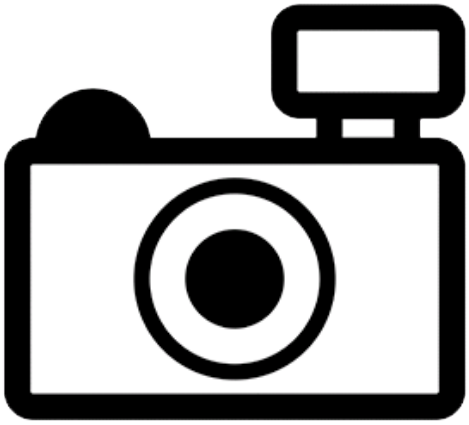
Bigeye Lates (*Lates mariae*) (a fish)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, February 2011
Revised, May 2019
Web Version, 3/3/2020



1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2019):

"Africa: Lake Tanganyika [Poll 1953; Coulter 1976]; widely distributed throughout the lake [Poll 1953]. In the Lukuga River (Lake Tanganyika outflow), known up to Niemba [Kullander et al. 2012]. In the Malagarazi River, known from the delta and the lower reaches [De Vos et al. 2001]."

From Ntakimazi (2006):

"Endemic to Lake Tanganyika where it also enters the deltas of major rivers including the Rusizi and Malagarasi."

Ntakimazi (2006) lists *Lates mariae* as extant in Burundi, The Democratic Republic of the Congo, Tanzania, and the United Republic of Zambia.

Status in the United States

Fuller (2019) lists *Lates mariae* as introduced in Texas through stocking in the 1980s. However, also all populations are now listed as failed or extirpated with the last recorded sighting in 1992.

From Howells (2001):

"Six specimens were placed in Smithers Reservoir (Brazos River drainage), Fort Bend County, in 1985 (Howells and Garrett 1992). None are known to remain."

Means of Introductions in the United States

From Fuller (2019):

"Intentional stocking [in the 1980s] by the Texas Parks and Wildlife Department for sport fishing."

Remarks

Lates mariae is listed as vulnerable by the IUCN (Ntakimazi 2006).

L. mariae has been stocked intentionally stocked within the United States by State fishery managers to achieve fishery management objectives. State fish and wildlife management agencies are responsible for balancing multiple fish and wildlife management objectives. The potential for a species to become invasive is now one important consideration when balancing multiple management objectives and advancing sound, science-based management of fish and wildlife and their habitat in the public interest.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From Fricke et al. (2019):

"Current Status: Valid as *Lates mariae* Steindachner 1909."

From ITIS (2019):

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

Family Centropomidae
Subfamily Latinae
Genus *Lates*
Species *Lates mariae* Steindachner, 1909

Size, Weight, and Age Range

From Froese and Pauly (2019):

"Maturity: L_m 45.5 […]
Max length : 80.0 cm TL male/unsexed [Daget 1986]"

Coulter (1981) lists *Lates mariae* as having a life span of over 10 years and a maximum length of 720mm.

From Coulter (1976):

"In these curves, the mean length of *L. mariae* males was 48.5 cm (standard deviation 7.4 cm) and females was 56-0 cm (S.D. 6-9 cm)."

Environment

From Froese and Pauly (2019):

"Freshwater; demersal; depth range ? - 75 m [Daget 1986]"

Climate/Range

From Froese and Pauly (2019):

"Tropical; 3°S - 9°S"

Distribution Outside the United States

Native

From Froese and Pauly (2019):

"Africa: Lake Tanganyika [Poll 1953; Coulter 1976]; widely distributed throughout the lake [Poll 1953]. In the Lukuga River (Lake Tanganyika outflow), known up to Niemba [Kullander et al. 2012]. In the Malagarazi River, known from the delta and the lower reaches [De Vos et al. 2001]."

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"Endemic to Lake Tanganyika where it also enters the deltas of major rivers including the Rusizi and Malagarasi."

Ntakimazi (2006) lists *Lates mariae* as extant in Burundi, The Democratic Republic of the Congo, Tanzania, and the United Republic of Zambia.

Introduced

There are no introductions of *Lates mariae* reported outside of their native range except for the United States in the 1980s.

Means of Introduction Outside the United States

There are no introductions of *Lates mariae* reported outside of their native range except for the United States in the 1980s.

Short Description

From Kinoshita and Tshibangu (1997):

"Juveniles could be identified to each species on the basis of the adult morphological characteristics (Poll, 1953): […]; *L. mariae*, by having nine dorsal spines (other species, seven or eight spines); […]."

"In the preflexion and flexion stages, small melanophores are found on the lower end of the preopercular ridge and under the throat, chin, abdomen, and rectum, in all species. […] Melanophores are found as two distinctive spots on the ventral margin of the tail in *L. mariae*"

"In the postflexion stage, melanophores are distributed on the head in all species. They […] occur on the lateral midline of the caudal peduncle, forming a single row in *L. mariae* […] In the juvenile stage, melanophores […] shrink individually, expand all over the body in *L. mariae* […]."

Biology

From Froese and Pauly (2019):

"Juveniles live in a specific inshore habitat until they reach 18 cm, thereafter they adopt a benthic habitat moving into deep water [Coulter 1976]. Juveniles have been observed near or in affluent rivers [Poll 1953]. Top predator in depths below 100 m; exploits both fishes and invertebrates; migrate diurnally to surface to feed on pelagic clupeids; highly susceptible to intensive fishing [Coulter 1976]."

From Ntakimazi (2006):

"Adults found in bentho-pelagic and littoral zones in the lake. Juveniles are found in lake's littoral zone, marginal macrophytes beds and lower parts of rivers."

From Coulter (1970):

"*L. mariae* and *L. angustifrons* feed on prawns and benthic fishes, but migrate up near the surface at night to feed copiously upon clupeids, particularly in the months when they are most abundant."

From Coulter (1976):

"After a post-larval pelagic phase, each *Lates* sp. spends 1 year in littoral weed. Thereafter, *L. mariae* adopts a benthic habitat moving into deep water […]."

"After leaving the weed cover, young *L. mariae* appeared to occupy progressively deeper water with increase in size."

Human Uses

From Froese and Pauly (2019):

"Fisheries: commercial; gamefish: yes"

From Ntakimazi (2006):

"Heavy fishing in pelagic and littoral zones."

Diseases

No information on diseases of *Lates mariae* was found. **No records of OIE-reportable diseases (OIE 2020) were found for *L. mariae*.**

Threat to Humans

From Froese and Pauly (2019):

"Harmless"

3 Impacts of Introductions

No records of established nonnative populations were found; therefore, there is no information on impacts of introductions.

4 Global Distribution

Figure 1. Map of Africa showing locations where *Lates mariae* has been reported. Locations are in Burundi, United Republic of Tanzania, and Zambia. Map from GBIF Secretariat (2019).

5 Distribution Within the United States

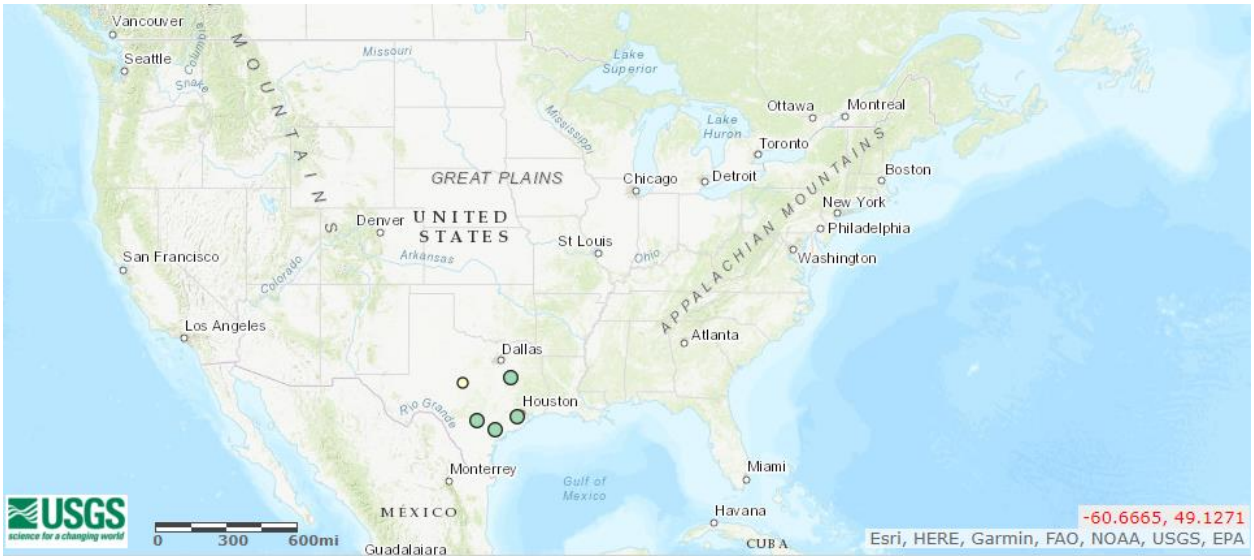

Figure 2. Previous distribution of *Lates mariae* in the United States. Map from Fuller (2019). The locations Texas represent areas where *Lates mariae* has been introduced, but those introductions did not result in established populations (Fuller 2019) and the locations were not used to select source points for the climate match.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Lates mariae* was low for the vast majority of the contiguous United States. The only areas that had any medium match were southern Florida, the Gulf Coast in Texas, and a few small areas along the southern border to the west coast of California. The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.000, low (scores between 0.000 and 0.005, inclusive, are classified as low). All States had low individual climate scores.

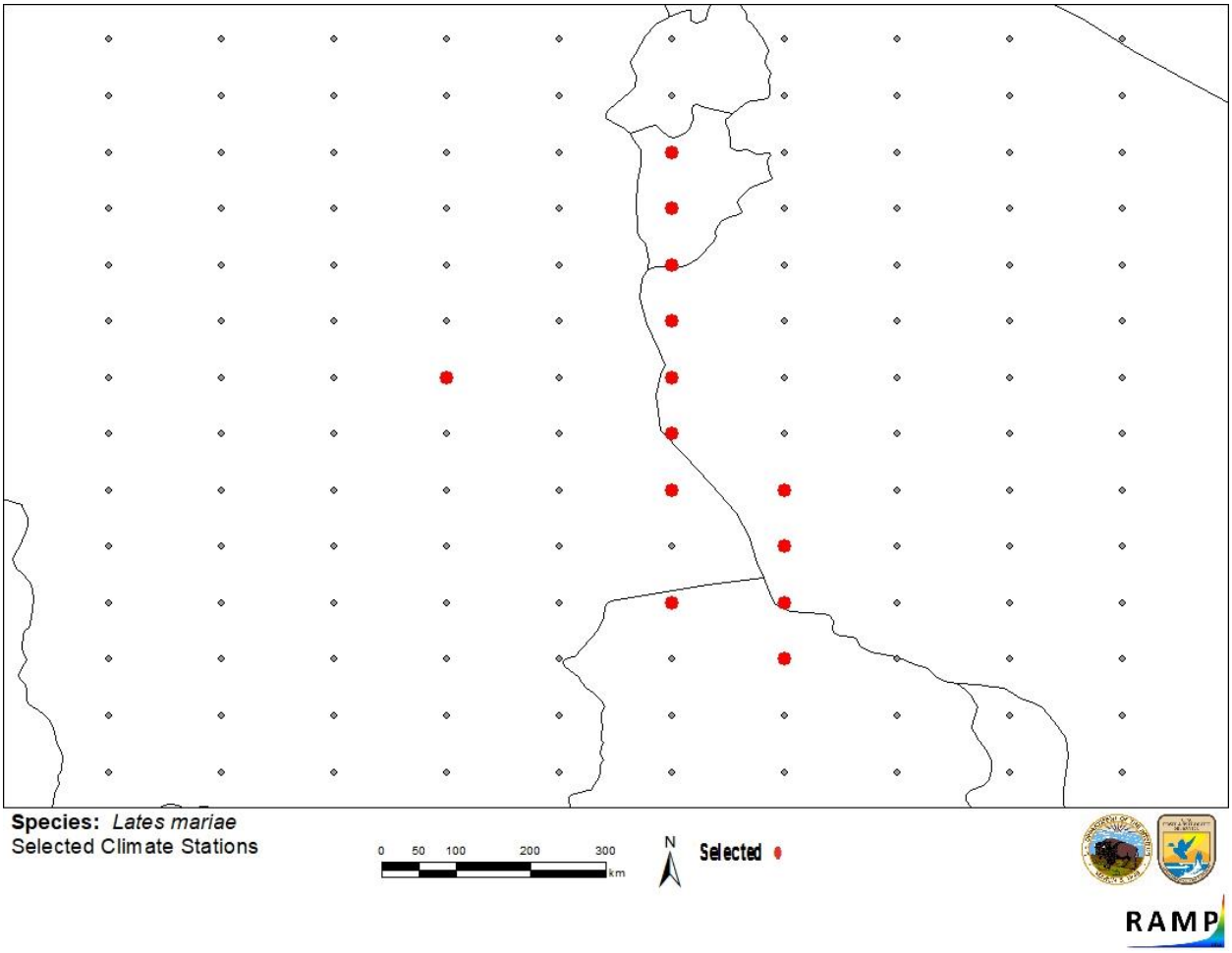

Figure 3. RAMP (Sanders et al. 2018) source map showing weather stations in eastern central Africa selected as source locations (red; Burundi, United Republic of Tanzania, Democratic Republic of the Congo and Zambia) and non-source locations (gray) for *Lates mariae* climate matching. Source locations from Ntakimazi (2006) and 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.

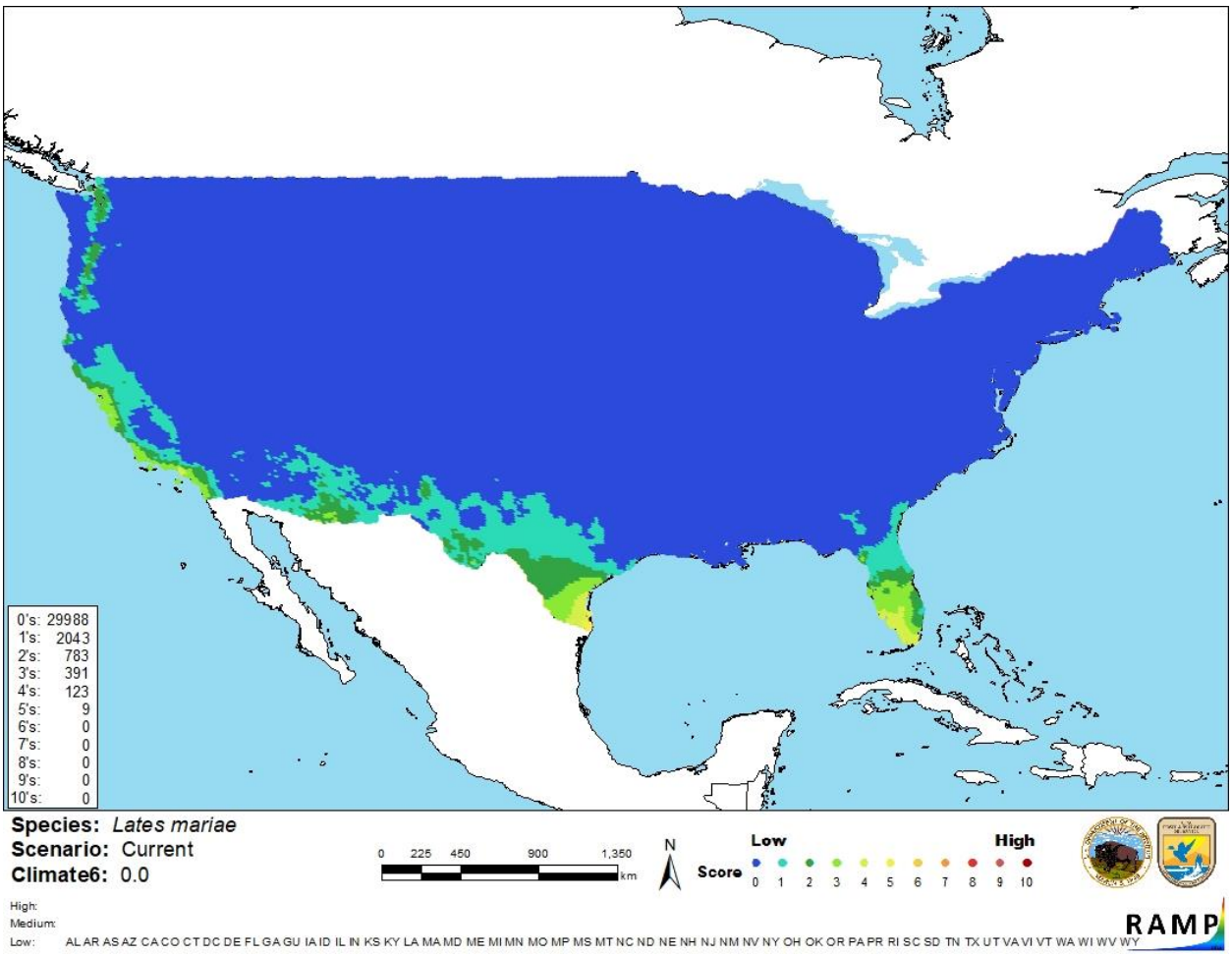

Figure 4. Map of RAMP (Sanders et al. 2018) climate matches for *Lates mariae* in the contiguous United States based on source locations reported by Ntakimazi (2006) and GBIF Secretariat (2019). Counts of climate match scores are tabulated on the left. 0 = Lowest match, 10 = Highest match.

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≤X≤0.005	Low
0.005<X<0.103	Medium
≥0.103	High

7 Certainty of Assessment

The certainty of assessment for *Lates mariae* is low. There is some quality information regarding the biology and native distribution of this species but almost no information on introductions. A single introduction was recorded but it did not result in a self-sustaining population. There is no information on impacts from this introduction.

8 Risk Assessment

Summary of Risk to the Contiguous United States

The Bigeye Lates (*Lates mariae*) is a fish native to Lake Tanganyika and some nearby rivers in Southeastern Africa. This species is both a popular gamefish and a commercial fishery in its native range. The popularity of *Lates mariae* has caused the population to decline. The history of invasiveness is uncertain. This species was purposely introduced into Texas in the 1980s as a potential gamefish but seemingly failed to establish. Other than in Texas, they have not been introduced anywhere outside of their native range. This species does not seem to be in trade. The overall climate match for the contiguous United States was low. All States received low individual climate scores. The certainty of assessment is low. The overall risk assessment category for *Lates mariae* is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): Uncertain**
- **Climate Match (Sec. 6): Low**
- **Certainty of Assessment (Sec. 7): Low**
- **Remarks/Important additional information:** Failed to establish in Texas.
- **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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