

# Tugela Labeo (*Labeo rubromaculatus*)

## Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, February 2012

Revised, June 2018

Web Version, 8/16/2018



Photo: P. Skelton. Licensed under Creative Commons (CC BY 4.0). Available: <https://www.gbif.org/occurrence/1265259267>. (June 2018).

## 1 Native Range and Status in the United States

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### Native Range

From Froese and Pauly (2018):

“Africa: endemic to the Tugela River system of the southern Cape watershed in Natal, South Africa”

### Status in the United States

This species has not been reported as introduced or established in the United States. There is no indication that this species is in trade in the United States.

### Means of Introduction into the United States

This species has not been reported as introduced or established in the United States.

## 2 Biology and Ecology

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### Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2018):

“Kingdom Animalia  
Subkingdom Bilateria  
Infrakingdom Deuterostomia  
Phylum Chordata  
Subphylum Vertebrata  
Infraphylum Gnathostomata  
Superclass Actinopterygii  
Class Teleostei  
Superorder Ostariophysi  
Order Cypriniformes  
Superfamily Cyprinoidea  
Family Cyprinidae  
Genus *Labeo*  
Species *Labeo rubromaculatus* Gilchrist and Thompson, 1913”

“Current Standing: valid”

### Size, Weight, and Age Range

From Froese and Pauly (2018):

“Max length : 50.0 cm SL male/unsexed; [Skelton 1993]; max. published weight: 2.9 kg [Lévêque and Daget 1984]”

### Environment

From Froese and Pauly (2018):

“Freshwater; benthopelagic; potamodromous [Riede 2004].”

### Climate/Range

From Froese and Pauly (2018):

“Subtropical; 25°S - 29°S”

“Occurs from near sea level to nearly 1,520 m [Lévêque and Daget 1984].”

## Distribution Outside the United States

### Native

From Froese and Pauly (2018):

“Africa: endemic to the Tugela River system of the southern Cape watershed in Natal, South Africa”

### Introduced

No introductions of this species have been reported.

## Means of Introduction Outside the United States

No introductions of this species have been reported.

## Short Description

From Ramoejane (2016):

“The *Labeo umbratus* Group (hereafter LUG) contains four species: *Labeo capensis* (Smith 1841), *Labeo umbratus* (Smith 1841), *Labeo seeberi* Gilchrist and Thompson 1911 and *Labeo rubromaculatus* Gilchrist and Thompson 1913. [...] Reid (1985) suggested that the anatomy of the mouth region of *L. rubromaculatus* is plesiomorphic compared with that of other species within the LUG, but *L. rubromaculatus* is otherwise morphologically similar to *L. umbratus* and *L. capensis*. *Labeo rubromaculatus* is distinct from the other species in the LUG in that its flanks are golden-red in live adult specimens and this species also has a higher gill raker count (43 vs 38-42 in the other LUG species; Reid, 1985).”

## Biology

From Froese and Pauly (2018):

“Prefers deep pools and slow-flowing river stretches but does occur in rocky rapids. Feeds on green algae, diatoms and detritus. Shoals migrate upstream in spring and summer to breed. Large numbers of small eggs are laid and young are found in shallow backwaters.”

From Cambray (2007):

“Widespread and common in the Tugela system.”

## Human Uses

From Froese and Pauly (2018):

“Fisheries: of potential interest; gamefish: yes”

## Diseases

No information available. No OIE-reportable diseases have been documented in this species.

## Threat to Humans

From Froese and Pauly (2018):

“Harmless”

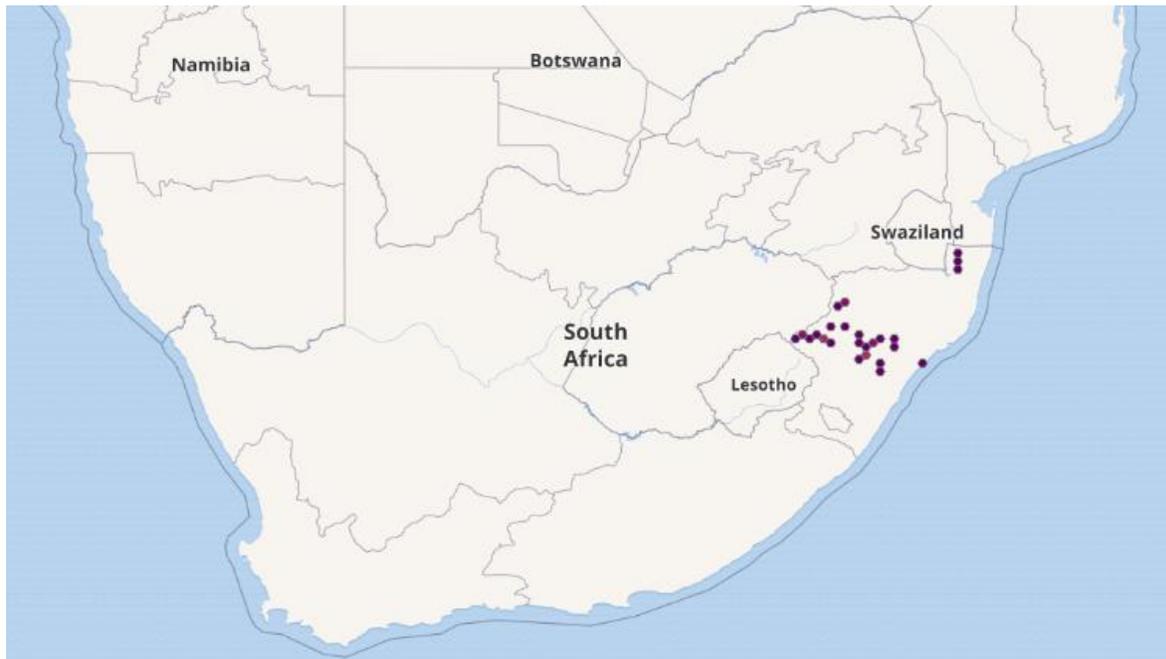
## 3 Impacts of Introductions

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No information available. No introductions of this species have been reported.

## 4 Global Distribution

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**Figure 1.** Known global distribution of *L. rubromaculatus*, reported from South Africa. Map from GBIF Secretariat (2017). The points near the border with Swaziland were excluded from the climate matching analysis because they lie outside the known established range of *L. rubromaculatus* in the Tugela River basin (Froese and Pauly 2018).

## 5 Distribution within the United States

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This species has not been reported as introduced or established in the United States.

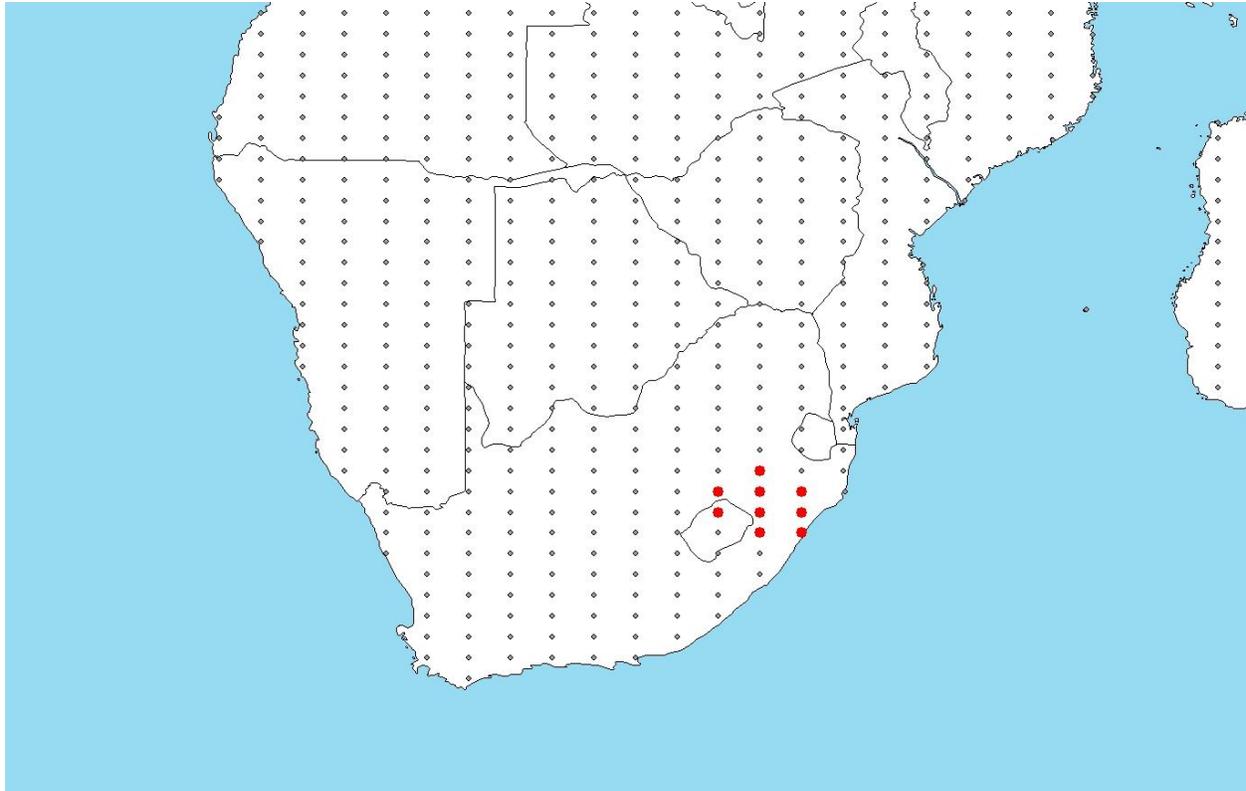
## 6 Climate Matching

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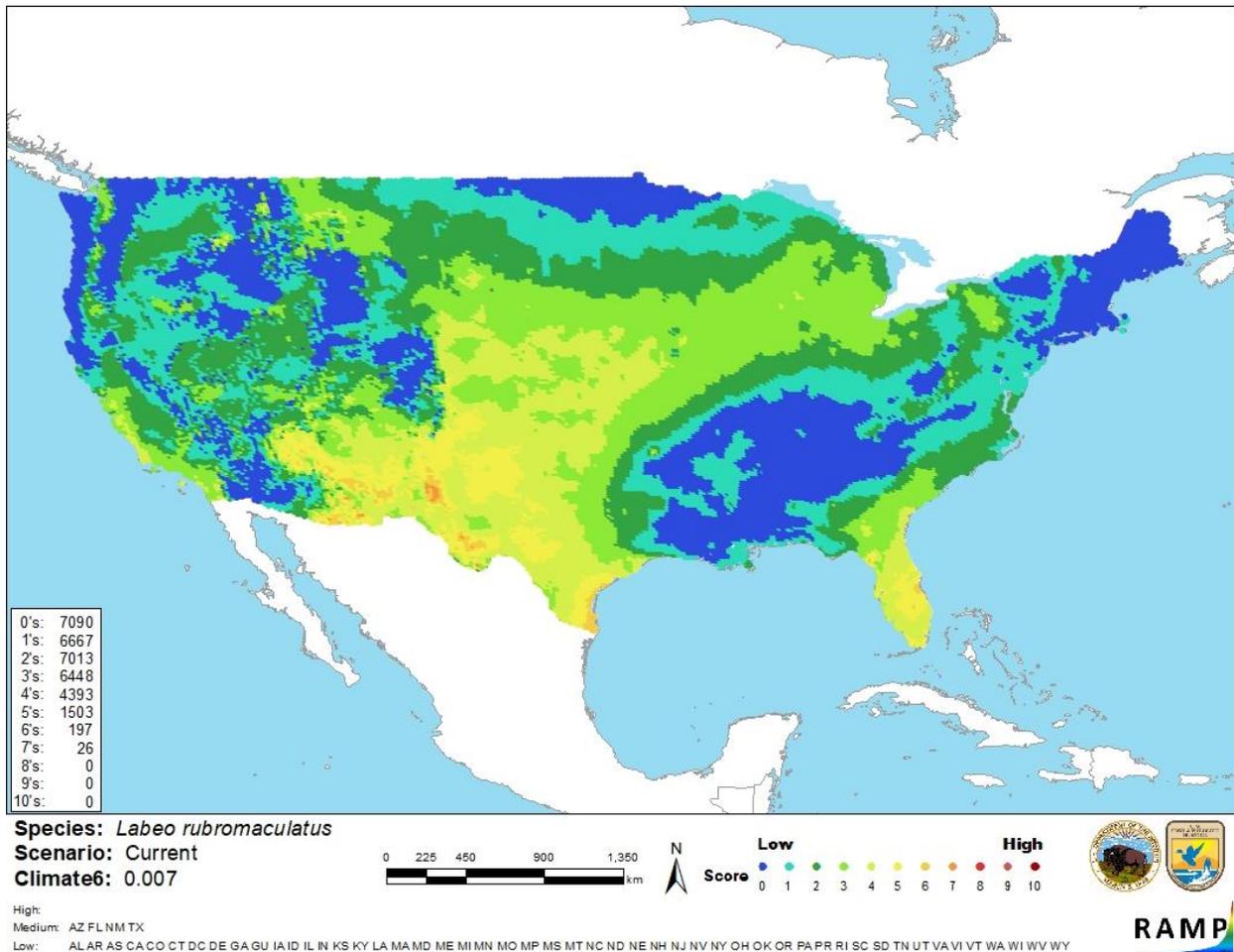
### Summary of Climate Matching Analysis

The climate match (Sanders et al. 2018; 16 climate variables; Euclidean Distance) for *Labeo rubromaculatus* was high in scattered locations in western Texas and New Mexico. Medium matches extended through peninsular Florida, the southern Great Plains, coastal Texas, much of the Southwest, and central coastal California. The remainder of the contiguous United States

showed low climate match. Climate 6 score indicated that the contiguous United States has a medium climate match overall. Scores between 0.005 and 0.103 are classified as medium match; Climate 6 score for *L. rubromaculatus* was 0.007.



**Figure 2.** RAMP (Sanders et al. 2018) source map showing weather stations in eastern South Africa and adjacent countries selected as source locations (red; South Africa, Lesotho) and non-source locations (gray) for *L. rubromaculatus* climate matching. Source locations from GBIF Secretariat (2017). Source climate locations are within 100 km of species occurrences; they do not represent exact locations of occurrences.



**Figure 3.** Map of RAMP (Sanders et al. 2018) climate matches for *L. rubromaculatus* in the contiguous United States based on source locations reported by GBIF Secretariat (2017). 0=Lowest match, 10=Highest match. Counts of climate match scores are tabulated on the left.

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

Limited information is available on the biology and ecology of *Labeo rubromaculatus*. No introductions of this species have been reported, so impacts of introduction remain unknown. Without further information on which to base the assessment of risk, certainty of this assessment is low.

## 8 Risk Assessment

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### Summary of Risk to the Contiguous United States

*Labeo rubromaculatus* is a species of carp endemic to the Tugela River basin in eastern South Africa. It is utilized as a gamefish and may have potential for development as a commercial fishery. *L. rubromaculatus* has a medium climate match with the contiguous United States, with high matches occurring in parts of Texas and New Mexico. However, the species has no reported history of introduction outside its native range. Certainty of the assessment is low and overall risk posed is uncertain.

### Assessment Elements

- **History of Invasiveness: Uncertain**
- **Climate Match: Medium**
- **Certainty of Assessment: Low**
- **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.**

- Cambray, J. 2007. *Labeo rubromaculatus*. The IUCN Red List of Threatened Species 2007: e.T63286A12634770. Available: <http://www.iucnredlist.org/details/full/63286/0>. (June 2018).
- Froese, R., and D. Pauly, editors. 2018. *Labeo rubromaculatus* Gilchrist & Thompson, 1913. FishBase. Available: <https://www.fishbase.de/summary/Labeo-rubromaculatus.html>. (June 2018).
- GBIF Secretariat. 2017. GBIF backbone taxonomy: *Labeo rubromaculatus* Gilchrist & Thompson, 1913. Global Biodiversity Information Facility, Copenhagen. Available: <https://www.gbif.org/species/5206098>. (June 2018).
- ITIS (Integrated Taxonomic Information System). 2018. *Labeo rubromaculatus* Gilchrist and Thompson, 1913. Integrated Taxonomic Information System, Reston, Virginia. Available: [https://www.itis.gov/servlet/SingleRpt/SingleRpt?search\\_topic=TSN&search\\_value=689338#null](https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=689338#null). (June 2018).
- Ramoejane, M. 2016. Genetic diversity, evolutionary relationships and conservation of southern African *Labeo* fishes in relation to water management. Doctoral dissertation. Rhodes University, Grahamstown, South Africa.
- Sanders, S., C. Castiglione, and M. Hoff. 2018. Risk Assessment Mapping Program: RAMP, version 3.1. U.S. Fish and Wildlife Service.

## 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.**

Lévêque, C., and J. Daget. 1984. Cyprinidae. Pages 217-342 in J. Daget, J.-P. Gosse, and D. F. E. Thys van den Audenaerde, editors. Check-list of the freshwater fishes of Africa (CLOFFA), volume 1. ORSTOM, Paris, and MRAC, Tervuren, Belgium.

Reid, G. M. 1985. A revision of African species of *Labeo* (V. V. Cramer). Cramer, Braunschweig, Germany.

Riede, K. 2004 Global register of migratory species - from global to regional scales. Final report of the R&D-Projekt 808 05 081. Federal Agency for Nature Conservation, Bonn, Germany.

Skelton, P. H. 1993. A complete guide to the freshwater fishes of southern Africa. Southern Book Publishers.