

Moggel (*Labeo umbratus*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, February 2012
Revised, February 2017
Web Version, 2/9/2018



Photo: Frederick Hermanus Van der Bank, University of Johannesburg. Public domain.
Available: http://eol.org/data_objects/27230572. (February 2017).

1 Native Range and Status in the United States

Native Range

From Swartz and Impson (2007):

“Gourits, Gamtoos, Sundays, Great Fish, Bushmans and Orange River systems in South Africa. Also occurs in the Orange River system in South Africa, Lesotho and Namibia.”

Status in the United States

This species has not been reported in the United States.

Means of Introduction of the United States

This species has not been reported in the United States.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2017):

“Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Osteichthyes
Class Actinopterygii
Subclass Neopterygii
Infraclass Teleostei
Superorder Ostariophysi
Order Cypriniformes
Superfamily Cyprinoidea
Family Cyprinidae
Genus *Labeo* Cuvier, 1816
Species *Labeo umbratus* (Smith, 1841)”

“Current Standing: valid”

Size, Weight, and Age Range

From Froese and Pauly (2016):

“Max length : 50.0 cm TL male/unsexed; [Skelton 1993]; max. published weight: 2.9 kg [Skelton 1993]”

From Skelton (2001):

“After 2-3 years males mature from about 150 mm SL or larger and females at about 250 mm SL. Ages of 5 or 6 years may be attained.”

Environment

From Froese and Pauly (2016):

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

From Skelton (2001):

“Prefers standing or gently flowing water and thrives in shallow impoundments and farm dams.”

Climate/Range

From Froese and Pauly (2016):

“Subtropical, preferred ?; 23°S - 34°S”

Distribution Outside the United States

Native

From Swartz and Impson (2007):

“Gourits, Gamtoos, Sundays, Great Fish, Bushmans and Orange River systems in South Africa. Also occurs in the Orange River system in South Africa, Lesotho and Namibia.”

Introduced

From Swartz and Impson (2007):

“Has been translocated to the Keiskamma and Buffalo River systems in the Eastern Cape Province and to the Olifants catchment of the Limpopo River system in Mpumalange Province in South Africa (Skelton 2001). There may be other areas where this species has become established due to inter-basin transfer schemes.”

Means of Introduction Outside the United States

From Swartz and Impson (2007):

“[...] inter-basin [water] transfer schemes.”

From Laurenson and Hocutt (1986):

“This species is indigenous to both the Orange and Fish River systems, but evidence nevertheless indicates that it has managed to survive passage through the [Orange-Fish] tunnel.”

From Jubb (1964):

“[...] *L. umbratus* is found today in the Buffalo River, but, as this is quite a recent discovery it is thought that *L. umbratus* was transported there by anglers who use this species as bait.”

Short Description

From Skelton (2001):

“D iii-iv, 9 (8-10); A iii, 5. Scales small, 53-68 in lateral line, 26-34 around caudal peduncle. Head rounded and fleshy, mouth small, subterminal or inferior, lips variable, with 2 small barbels. Greyish with iridescent pink and cream mottling, off-white below.”

Biology

From Skelton (2001):

“Feeds on soft sediments and detritus. Breeds after rains in summer, migrating upstream to suitable spawning sites over flooded grassy banks of rivers or within shallow rocky stretches. Highly fecund, large females producing as many as 250 000 small eggs. The sticky eggs attach to grass on rocks, hatching after about 40 hours. The newly hatched larvae swim repeatedly to the surface and are carried by the current into the stream and deeper water. Growth is rapid and the young fish reach about 100 mm SL after a year. After 2-3 years males matures from about 150 mm SL or larger and females at about 250 mm SL. [...] Known to hybridise with the Orange River mudfish (*L. capensis*), especially in impounded waters.”

Human Uses

From Froese and Pauly (2016):

“Fisheries: commercial; aquaculture: experimental; gamefish: yes”

Diseases

From van As and Basson (1984):

“*Lernaea barnimiana*.

Lernaea sp.

Argulus japonicus.”

From Crafford et al. (2014):

“*D[actylogyrus] iwani*”

“*D[actylogyrus] larindae*”

“*D[ogelius] intorquens*”

Threat to Humans

From Froese and Pauly (2016):

“Harmless”

3 Impacts of Introductions

From Swartz and Impson (2007):

“Hybridisation between potentially historically isolated lineages of this species may have already occurred due to inter-basin transfer schemes.”

4 Global Distribution

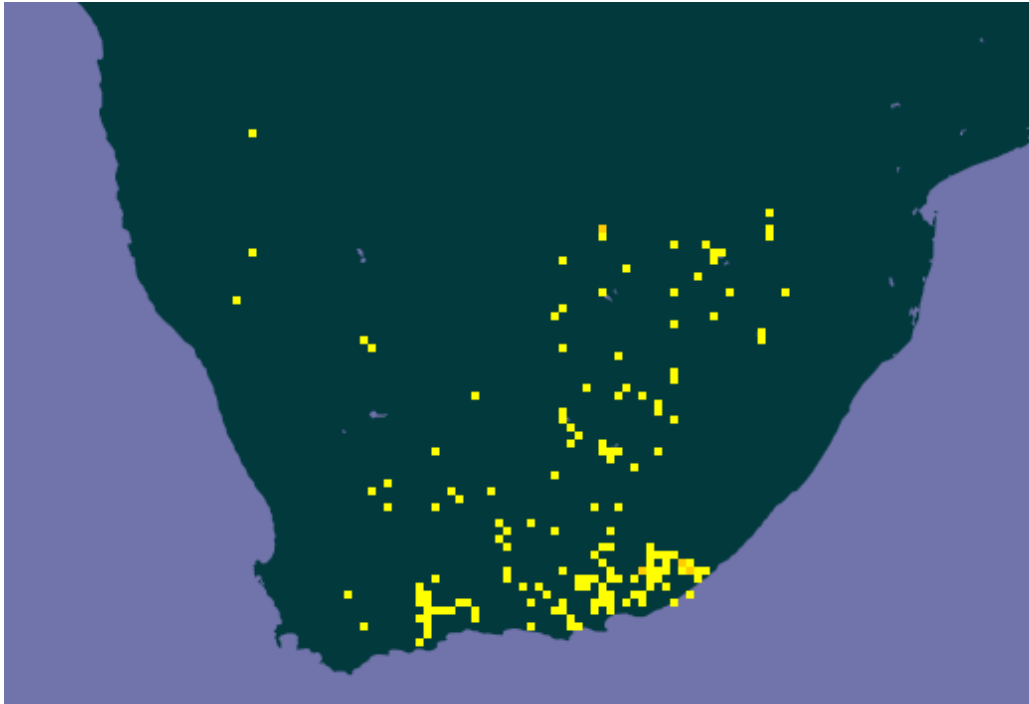


Figure 1. Known global established locations of *Labeo umbratus* in southern Africa. Map from GBIF (2016).

5 Distribution Within the United States

This species has not been reported in the United States.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean Distance) was high in western Texas, New Mexico, and eastern Arizona. Medium and low climate matches were scattered throughout the remainder of the western contiguous U.S. The climate match was low in the eastern and north-central U.S. The Climate 6 proportion indicated that the contiguous U.S. has a high climate match overall. Proportions of 0.103 or higher indicate a high climate match; the climate match of *Labeo umbratus* was 0.144.

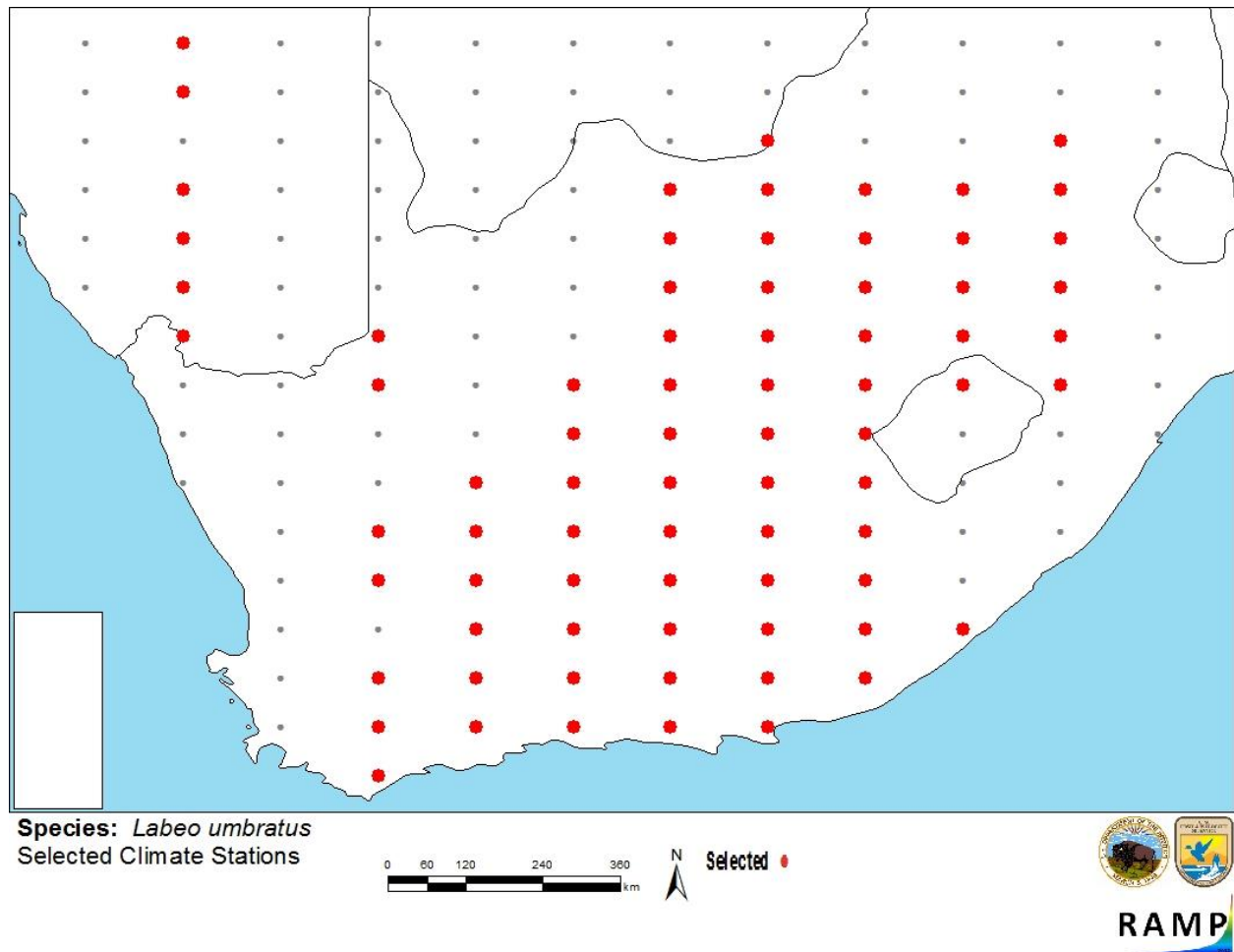


Figure 2. RAMP (Sanders et al. 2014) source map of southern Africa showing weather stations selected as source locations (red) and non-source locations (gray) for *Labeo umbratus* climate matching. Source locations from GBIF (2016).

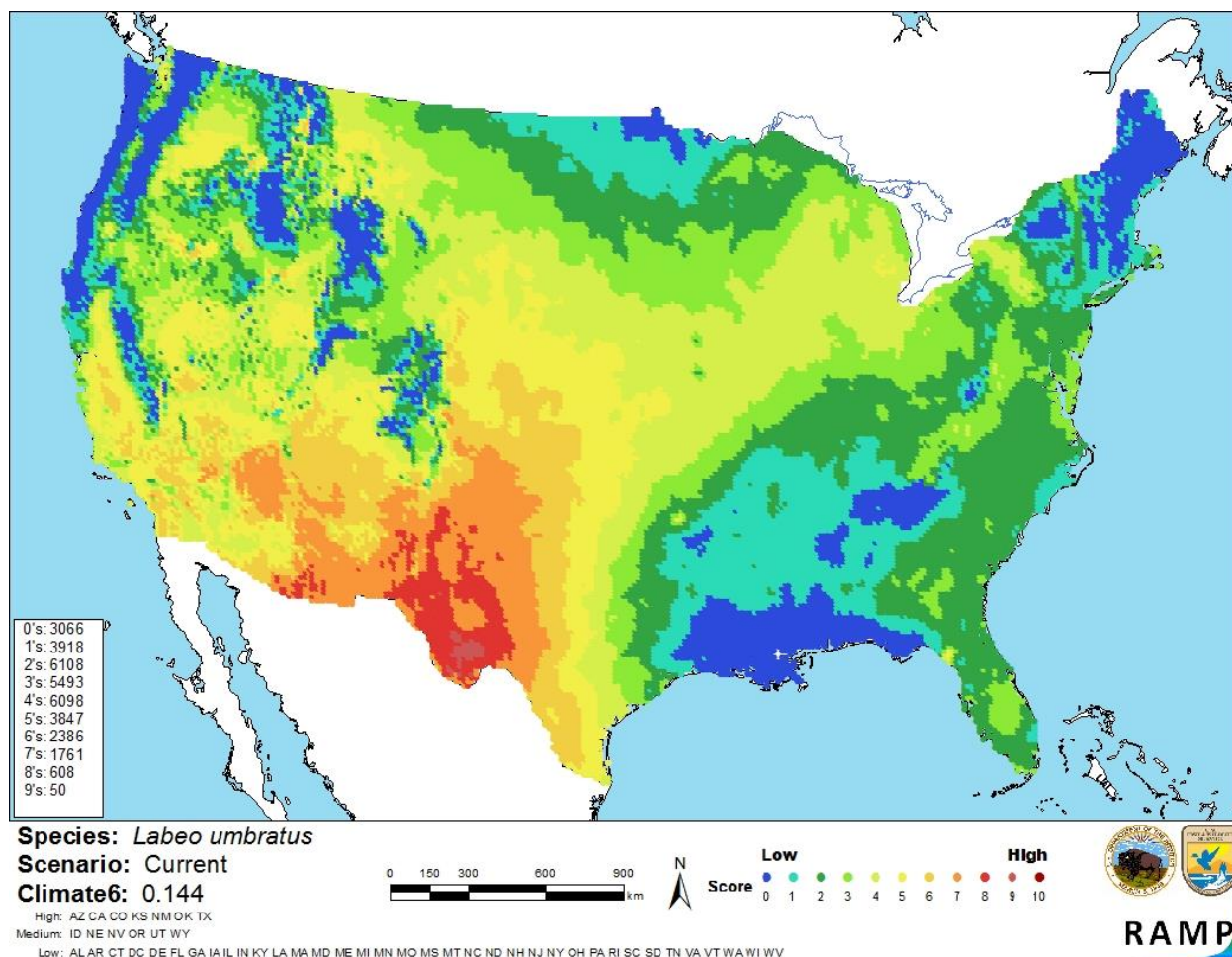


Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *Labeo umbratus* in the contiguous United States based on source locations reported by GBIF (2016). 0= Lowest match, 10= Highest match. Counts of climate match scores are tabulated on the left.

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
≥ 0.103	High

7 Certainty of Assessment

Information is available on the biology and distribution of *Labeo umbratus*. Although *L. umbratus* has been introduced to novel locations, hardly any information is available on the impacts of these introductions. The certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Labeo umbratus is a cyprinid fish native to South Africa, Lesotho, and Namibia. The species has become established in additional river basins within South Africa through inter-basin water transfer schemes and perhaps movement by anglers as bait. Inter-basin transfer schemes have also connected historically isolated populations of the species which may have resulted in hybridization between these populations. Otherwise, no impacts of introduction have been reported yet. Climate match to the contiguous U.S. is high. Overall risk posed by *L. umbratus* is uncertain.

Assessment Elements

- **History of Invasiveness: None Documented**
- **Climate Match: High**
- **Certainty of Assessment: Low**
- **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.

- Crafford, D., W. Luus-Powell, and A. Avenant-Oldewage. 2014. Monogenean parasites from fishes of the Vaal Dam, Gauteng Province, South Africa. I. Winter survey versus summer survey comparison from *Labeo capensis* (Smith, 1841) and *Labeo umbratus* (Smith, 1841) hosts. *Acta Parasitologica* 59(1):17-24.
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- GBIF (Global Biodiversity Information Facility). 2016. GBIF backbone taxonomy: *Labeo umbratus* (Smith, 1841). Global Biodiversity Information Facility, Copenhagen. Available: <http://www.gbif.org/species/5206121>. (February 2017).
- ITIS (Integrated Taxonomic Information System). 2017. *Labeo umbratus* (Smith, 1841). Integrated Taxonomic Information System, Reston, Virginia. Available: https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=163686#null. (February 2017).
- Jubb, R. A. 1964. Freshwater fishes and drainage basins in southern Africa. 1. The Orange and South Coastal drainage basins. *South African Journal of Science* 60(1):17-21.
- Laurenson, L. B. J., and C. H. Hocutt. 1986. Colonisation theory and invasive biota: the Great Fish River, a case history. *Environmental Monitoring and Assessment* 6:71-90.

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- Skelton, P. 2001. A complete guide to the freshwater fishes of southern Africa. Struik Publishers, Cape Town, South Africa.
- Swartz, E., and D. Impson. 2007. *Labeo umbratus*. The IUCN Red List of Threatened Species 2007: e.T63288A12635757. Available: <http://www.iucnredlist.org/details/63288/0>. (February 2017).
- van As, J. G., and L. Basson. 1984. Checklist of freshwater fish parasites from southern Africa. South African Journal of Wildlife Research 14(2):49-61.

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.

- 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.