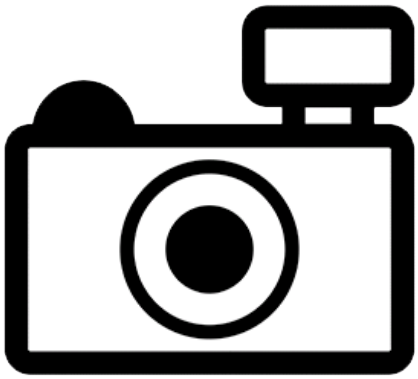
Silver Labeo (*Labeo ruddi*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, February 2012
Revised, July 2018
Web Version, 7/13/2018



No Photo Available

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2018):

"Africa: within the drainage basin of the Limpopo and Incomati [Mozambique, South Africa, Zimbabwe], as well as the Cunene [Angola, Namibia; Skelton 1993] but not in the Pongolo."

From Engelbrecht et al. (2007):

"Low-veld sections of the Limpopo and Incomati Rivers (South Africa, Swaziland and Mozambique). A single record from the lower Mbuluzi River in Swaziland. A northern population is known from the Cunene River on the Angolan-Namibian border."

"**Native:** Angola; Mozambique; Namibia; South Africa (Limpopo Province, Mpumalanga); Swaziland; Zimbabwe"

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.

Remarks

From Engelbrecht et al. (2007):

"Two distinct geographic populations exist. It was described from the Limpopo River system in South Africa and is also recorded from the Cunene River on the Angolan-Namibian border. The taxonomic status of the Cunene population needs examination [*sic*]."

In this ERSS, the Cunene population was treated as a valid population of *L. ruddi*, as currently recognized.

2 Biology and Ecology

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 ruddi* Boulenger, 1907"

"Current Standing: valid"

Size, Weight, and Age Range

From Froese and Pauly (2018):

"Max length : 30.0 cm SL male/unsexed; [Skelton 1993]; max. published weight: 1.0 kg [Skelton 1993]"

Environment
From Froese and Pauly (2018):

"Freshwater; benthopelagic; pH range: 7.0 - ? ; dH range: 10 - 15; potamodromous [Riede 2004]."

"[…] 23°C - 27°C [Baensch and Riehl 1991; assumed to represent recommended aquarium water temperature]"

Climate/Range
From Froese and Pauly (2018):

"Tropical; […] 13°S - 26°S"

Distribution Outside the United States
Native
From Froese and Pauly (2018):

"Africa: within the drainage basin of the Limpopo and Incomati [Mozambique, South Africa, Zimbabwe], as well as the Cunene [Angola, Namibia; Skelton 1993] but not in the Pongolo."

Froese and Pauly (2018) report *L. ruddi* as native to the following countries: Angola, Mozambique, Namibia, South Africa, Zimbabwe.

From Engelbrecht et al. (2007):

"Low-veld sections of the Limpopo and Incomati Rivers (South Africa, Swaziland and Mozambique). A single record from the lower Mbuluzi River in Swaziland. A northern population is known from the Cunene River on the Angolan-Namibian border."

"**Native:** Angola; Mozambique; Namibia; South Africa (Limpopo Province, Mpumalanga); Swaziland; Zimbabwe"

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 Du Plessis (1963):

"In life this fish is olive brown on the back with a dark band behind the operculum. There is no red on the snout but a little is present in the eye above the iris. Paired fins are flesh-coloured,

tinged with black. The edges of the dorsal and caudal have a reddish tint, more marked in the caudal."

"The mouth is small and subinferior with thin lips, fringed with very feeble papillae. Warts are usually absent on the snout or, when present, poorly developed. The vestigial posterior barbel is very short and variable in length, sometimes being absent on one side."

Biology

From Froese and Pauly (2018):

"Habitat preference is warm middle and low veldt streams and larger pools over muddy bottoms [Reid 1985]. Feeds on organic sediments. Moves up rain-swollen rivers to breed [Skelton 1993]."

From Engelbrecht et al. (2007):

"Very little information available for this species. Said to be fairly common in the Umzingwane (Limpopo) River, Zimbabwe (Bell-Cross and Minshull 1988). In most other regions it appears to be rare."

"Deeper waters in or associated with main river channels and off channel pools. Sand or mud substrates are typical. Particularly common in seasonal river e.g. the Shingwedzi River, Kruger Park, South Africa."

Human Uses

From Froese and Pauly (2018):

"Gamefish: yes"

Diseases

Olivier et al. (2009) list *L. ruddi* as host of six monogean parasite species of the genus *Dactylogyrus* and three monogean parasite species of the genus *Dogielius*.

Smit et al. (2017) report *L. ruddi* as a host for the freshwater copepod *Lernaea cyprinacea*.

From Smit et al. (2017):

"The global distribution of the copepod *Lernaea cyprinacea* as an invasive ectoparasite, and the severe effects of it on native freshwater fish hosts, has been well documented (see Welicky et al., 2017)."

"Globally, the severe effects on native freshwater fish hosts by *L. cyprinacea* have been well documented; however, the first study on the impact of this co-invader on native fish health in South Africa is the recent work by Welicky et al. (2017). In their paper, the authors reported on

the change in host health following a natural drought induced treatment for *L. cyprinacea*, leaving hosts without this parasite in a much better overall health state than those infected."

Kunutu et al. (2018) list *L. ruddi* as a host for the freshwater copepod *Lamproglena cleopatra*.

No OIE-reportable diseases have been documented for this species.

Threat to Humans

From Froese and Pauly (2018):

"Harmless"

3 Impacts of Introductions

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

4 Global Distribution

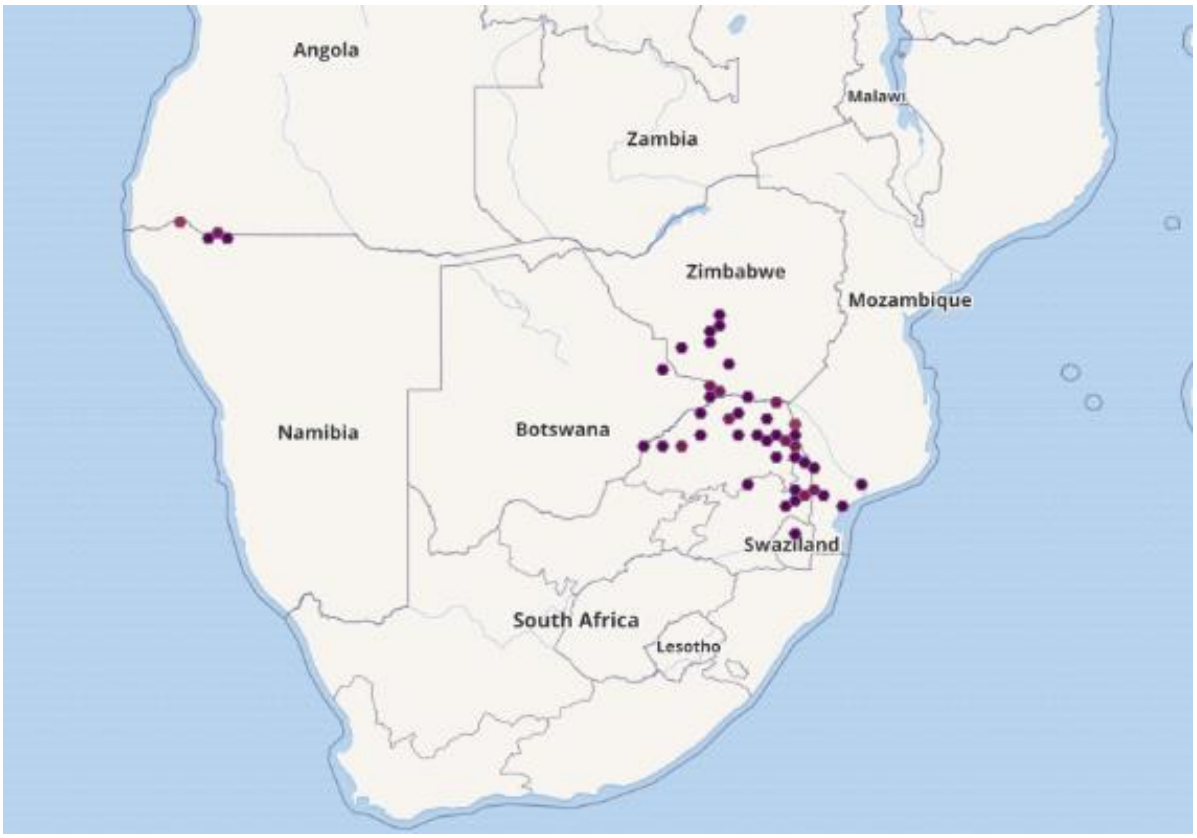


Figure 1. Known global distribution of *Labeo ruddi*. Map from GBIF Secretariat (2017). Although Botswana was not included in the list of countries where *L. ruddi* is present (see Distribution Outside the United States), the locations reported in eastern Botswana were included in the climate matching analysis. These points lie within the Limpopo basin where *L. ruddi* is native and the occurrences appear to be legitimate.

5 Distribution within the United States

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

6 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2018; 16 climate variables; Euclidean Distance) was high along the U.S.-Mexico border from Texas to eastern Arizona. Most of Texas, New Mexico, and Arizona had medium match, as did coastal California and peninsular Florida. The remainder of the contiguous United States had a low match. Climate 6 score indicated that climate match to the contiguous United States is medium overall. Scores between 0.005 and 0.103 are classified as medium match; Climate 6 score for *L. ruddi* was 0.036.

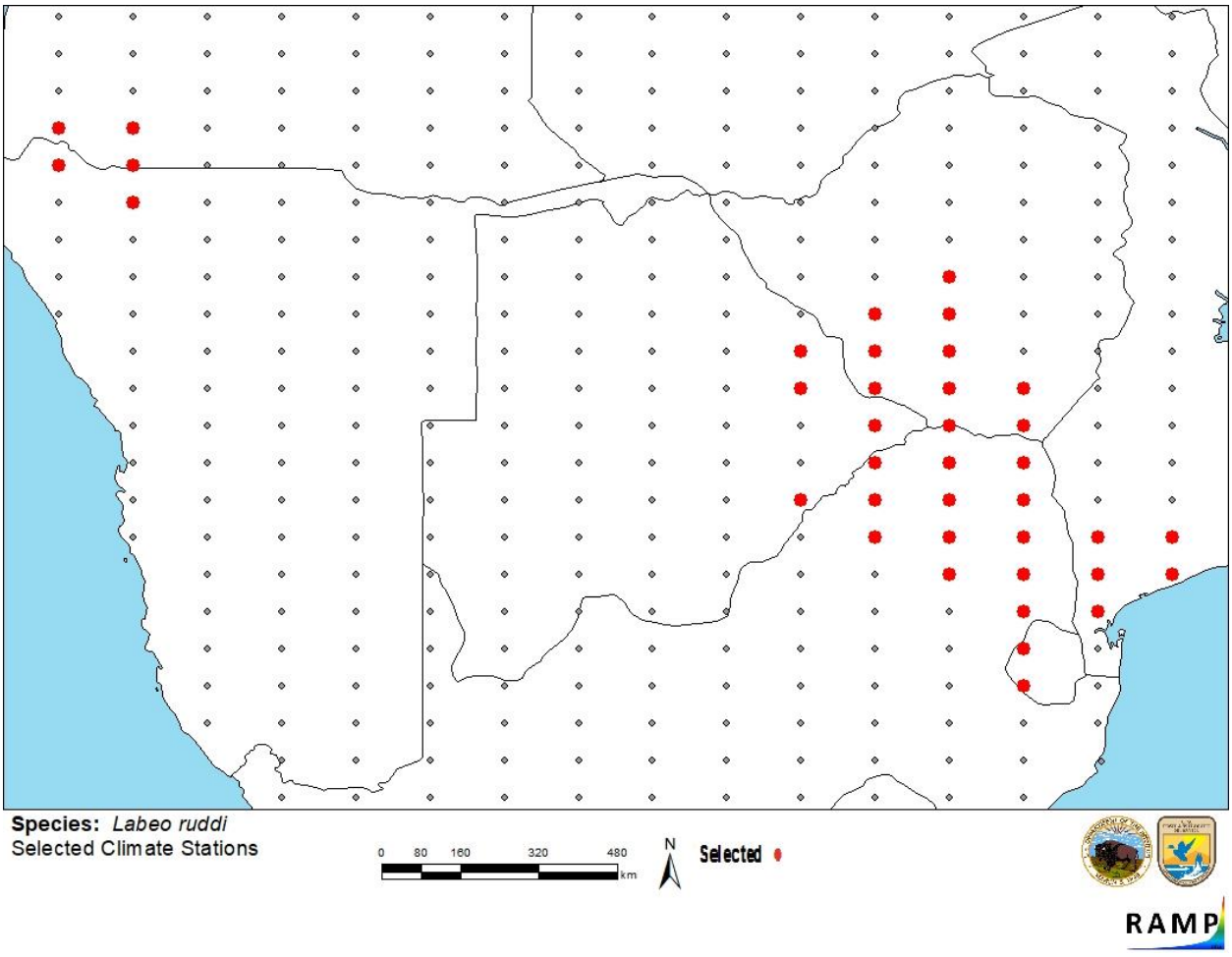


Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations selected as source locations (red; Angola, Namibia, Botswana, Zimbabwe, Mozambique, South Africa, and Swaziland) and non-source locations (gray) for *L. ruddi* climate matching. Source locations from GBIF Secretariat (2017).

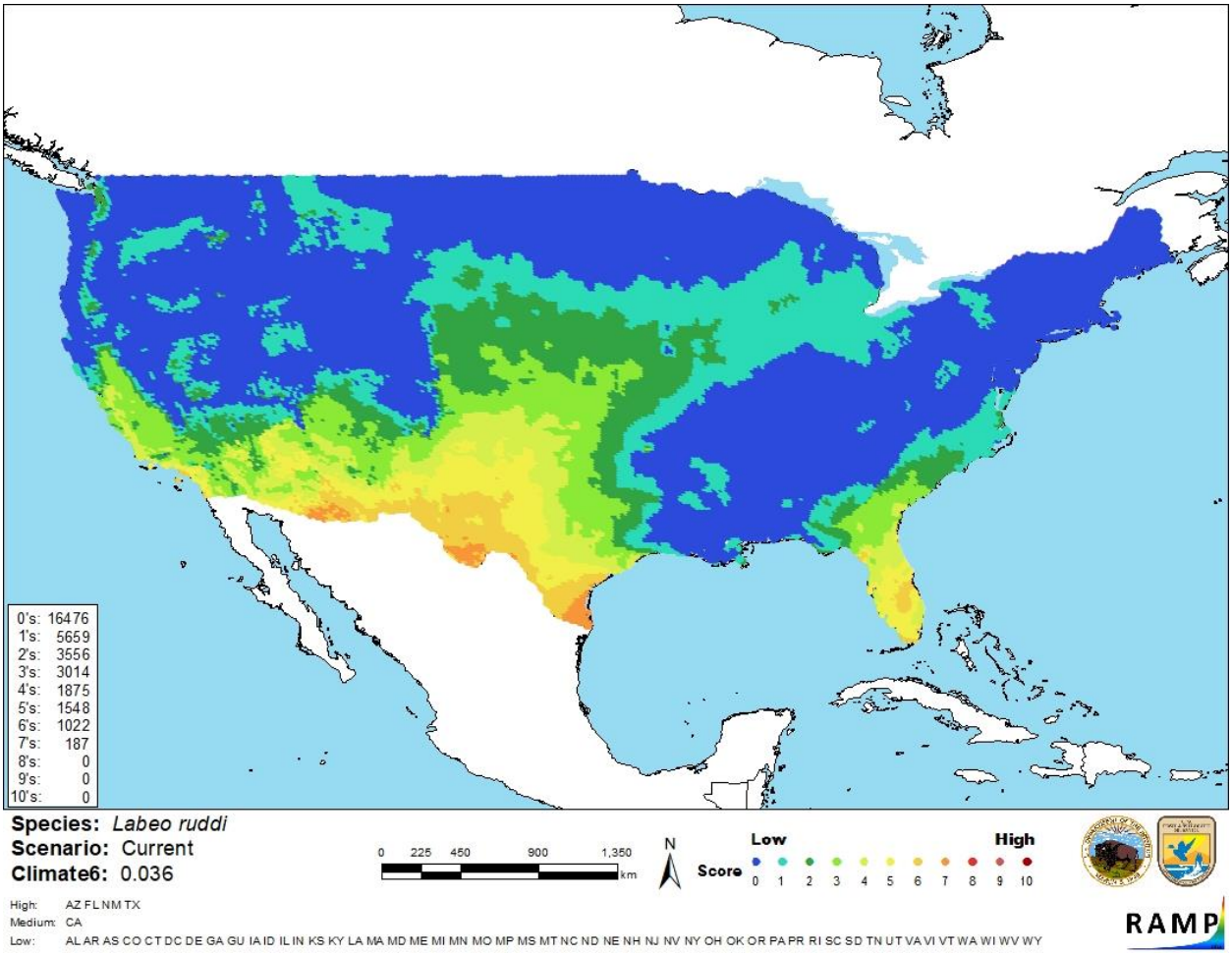


Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *L. ruddi* in the contiguous United States based on source locations reported by GBIF Secretariat (2017). 0=Lowest match, 10=Highest match.

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

Limited information is available on the biology and ecology of *Labeo ruddi*. There is some uncertainty about the taxonomic status of the population in Angola and Namibia. No introductions of this species have been reported, so no information is available on impacts of introductions. Certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Silver Labeo (*Labeo ruddi*) is a species of carp native to southern Africa. It is utilized as a game fish in its native range. *L. ruddi* has not been reported as introduced outside its native range. Climate match to the contiguous United States is medium overall, with high to medium matches occurring in Florida, Texas, New Mexico, Arizona, and coastal California. Certainty of the assessment is low. Without a history of introduction, the overall risk posed by *L. ruddi* to the contiguous United States is uncertain.

Assessment Elements

- **History of Invasiveness: Uncertain**
- **Climate Match: Medium**
- **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.

Du Plessis, S. S. 1963. A revision of the genus *Labeo* (Pisces: Cyprinidae) in the Transvaal, with a description of a new species. Annals of the Transvaal Museum 24(4):327-337.

Engelbrecht, J., R. Bills, and B. E. Marshall. 2007. *Labeo ruddi*. The IUCN Red List of Threatened Species 2007: e.T63287A12635374. Available: http://dx.doi.org/10.2305/IUCN.UK.2007.RLTS.T63287A12635374.en. (July 2018).

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Kunutu, K. D., S. Tavakol, A. Halajian, C. Baker, M. Paoletti, R. A. Heckmann, and W. J. Luus-Powell. 2018. Expanded description of *Lamproglena cleopatra* Humes, 1957 (Lernaeidae: Copepoda) from *Labeo* spp. (Cyprinidae) with a key to species of *Lamproglena* von Nordmann, 1832. Systematic Parasitology 95:91-103.

Olivier, P. A. S., W. J. Luus-Powell, and J. E. Saayman. 2009. Report on some monogenean and clinostomid infestations of freshwater fish and waterbird hosts in Middle Letaba Dam, Limpopo Province, South Africa. Onderstepoort Journal of Veterinary Research 76:187-199.

Sanders, S., C. Castiglione, and M. Hoff. 2018. Risk Assessment Mapping Program: RAMP, version 3.1. U.S. Fish and Wildlife Service.

Smit, N. J., W. Malherbe, and K. A. Hadfield. 2017. Alien freshwater fish parasites from South Africa: diversity, distribution, status and the way forward. International Journal for Parasitology: Parasites and Wildlife 6:386-401.

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.

Baensch, H. A., and R. Riehl. 1991. Aquarien atlas, volume 3. Mergus, Verlag für Natur- und Heimtierkunde, Melle, Germany.

Bell-Cross, G., and J. L. Minshull. 1988. The fishes of Zimbabwe. National Museums and Monuments of Zimbabwe, Harare, Zimbabwe.

Reid, G. M. 1985. A revision of African species of *Labeo* (Pisces: Cyprinidae) and a re-definition of the genus. Verlag von J. 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.

Welicky, R. L., J. De Swart, R. Gerber, E. Netherlands, and N. J. Smit. 2017. Drought-associated absence of alien invasive anchorworm, *Lernaea cyprinacea* (Copepoda: Lernaeidae), is related to changes in fish health. International Journal for Parasitology: Parasites and Wildlife 6(3):430-438.