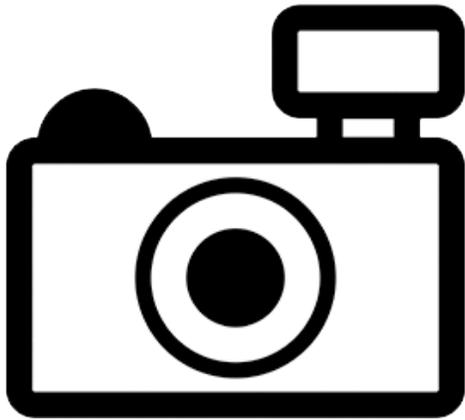


African Butter Catfish (*Schilbe mystus*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, April 2015
Revised, December 2017
Web Version, 12/20/2019



No Photo Available

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2019):

“Africa: Nilo-Sudanese species, known from the Nile basin and in West Africa from the Senegal River eastwards to the Cross, Wouri and Sanaga River, including the Chad basin [De Vos 1995]. Various reports, including from the Ogowe and Congo River basin or Zambia and Zimbabwe, are based on misidentifications [De Vos 1995]. Reports from Angola and Tanzania are questionable and need confirmation.”

“Known from the Ouémé River [Benin] [De Vos 1995, 2003].”

“Known from the Black Volta [Burkina Faso] [De Vos 1995, 2003].”

“[In Cameroon:] Known from the Cross River [Teugels and Thys van den Audenaerde 1990; De Vos 1995, 2003, 2007], the Sanaga River basin [Vivien 1991; De Vos 1995, 2007; Boden et al. 1997], Wouri [De Vos 1995, 2007], the Benue River [Vivien 1991; De Vos 1995, 2003], Lake Chad [Vivien 1991; De Vos 1995, 2003] and the coastal rivers of the West [Vivien 1991].”

“Known from the Chari-Logone system (Chad basin) [Central African Republic] [De Vos 2003].”

“Known from Lake Chad and the Chari-Logone system [Chad] [De Vos 1995, 2003].”

“Known from Lake Albert [Democratic Republic of the Congo] [De Vos 1995].”

“Present in the lower Nile and Nile delta [Egypt] [De Vos 1995].”

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“Known from the Corubal [Guinea-Bissau] [De Vos 2003].”

“Known from Mano, Loffa and Saint Paul rivers [Liberia] [De Vos 2003].”

“[In Mali:] Known from the upper [De Vos 2003] and middle Niger, and from the inner Niger delta [De Vos 1995, 2003].”

“Known from the middle Niger [Niger] [De Vos 1995, 2003].”

“[In Nigeria:] Known from the rivers Ogun [Paugy et al. 1994; De Vos 2003], Oshun, Kwa Ibo [De Vos 2003], Cross [De Vos 1995, 2003, 2007] and Ehoma Floodplain, Afikpo [Oti 2003]. In the Niger basin known from the Sokoto [De Vos 2003], middle Niger, Lake Kainji, lower Niger, Benue and Niger delta [De Vos 1995, 2003]. Widely distributed in Lake Kainji, [...]”

“Present in the Senegal River [Senegal] [De Vos 1995, 2003; Diouf 1996].”

“Known from the Little Scarcies and Pampana/Jong [Sierra Leone] [De Vos 2003].”

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“[In Togo:] Known from the Oti (Volta basin) [De Vos 1995, 2003] and Mono [De Vos 2003].”

“Known from the Semliki River [Uganda] [De Vos 1995].”

Froese and Pauly (2019) also list *Schilbe mystus* as native in Cote d’Ivoire, Mauritania

Due to some misidentifications of closely related species some reports of *Schilbe mystus* pertain instead to *S. intermedius* and *S. grenfelli*. Known misidentifications or reports where the species identification is questionable are detailed below.

From Froese and Pauly (2019):

“Also reported [in Cameroon] as "probably in Congo River [=Zaire River]" [Vivien 1991], but reports from the Congo basin are based on misidentifications [De Vos 1995].”

“Report from the Ubangi [Democratic Republic of the Congo] [Boulenger 1911] belongs to *Schilbe grenfelli* [De Vos 1995].”

“Reports in [Angola in] [Poll 1967] probably refer to *Schilbe intermedius*; [...].”

“[In Tanzania:] Present in Lake Victoria, eastern rivers, inland drainage and Lake Rukwa; seasonally important in Lake Victoria [Eccles 1992]; unconfirmed in other sources [De Vos 1995]; needs verification.”

“Collections made from Kisumu area, and Nyando river, Lake Victoria basin [Anonymous 1999], but reports of *Schilbe mystus* from Kenya are misidentifications of *S. intermedius* [Seegers et al. 2003].”

“Reports of *Schilbe mystus* from the Caprivi [Namibia] [van der Waal and Skelton 1984] refer to *Schilbe intermedius* [De Vos 1995].”

“[In Zambia:] Reports of *Schilbe mystus* from Lake Kariba [Losse 1998], Lake Itezhi-tezhi [Kapasa and Cowx 1991] and Luongo River [Balon and Stewart 1983] refer to *Schilbe intermedius* [De Vos 1995].”

“Reports of *Schilbe mystus* from Zimbabwe [Bell-Cross and Minshull 1988] refer to *Schilbe intermedius* [De Vos 1995].”

Status in the United States

No records of *Schilbe mystus* in the United States were found. It is in trade within the United States.

From Bluegrassaquatics (2019):

“*Schilbe mystus* catfish – regular [sic] size
\$6.48”

Means of Introductions in the United States

No records of *Schilbe mystus* in the wild in the United States were found.

Remarks

Information searches were conducted using the valid name *Schilbe mystus* and the synonym *S. niloticus*. Information using the name *S. intermedius* was not included as this is a separate valid species (Fricke et al. 2019).

From CABI (2015):

“Caution should be excised when examining the documented distribution records of the African butter catfish outside its native range, especially records attributed to southern Africa. This is because the southern African congener was previously known as *Schilbe mystus*, but was revalidated to *Schilbe intermedius* Rüppel 1832 (De Vos and Skelton, 1990), but documented occurrence records have not been changed to reflect this change in taxonomy.”

From Azeroual et al. (2010):

“This species has been commonly referred to as *Schilbe (Eutropius) niloticus*. As indicated above, morphological examination of the holotype of *Silurus mystus* Linnaeus, 1758 (De Vos & Skelton, 1990) indicates that that specimen and *S. (E.) niloticus* (Rüppell, 1829) belong to the same species. As a result the older name, *S. mystus* is the correct replacement name for *S. niloticus*. Cited by Bishai and Khalil (1997) as *Schilbe (Schilbe) mytus* (Linnaeus, 1758)”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From Fricke et al. (2019):

“**Current status:** Valid as *Schilbe mystus* (Linnaeus 1758).”

From ITIS (2015):

“Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Osteichthyes
Class Actinopterygii
Subclass Neopterygii
Infraclass Teleostei
Superorder Ostariophysi
Order Siluriformes
Family Schilbeidae
Genus *Schilbe*
Species *Schilbe mystus* (Linnaeus, 1758)”

Size, Weight, and Age Range

From Froese and Pauly (2019):

“Maturity: L_m 13.1, range 15 - ? cm

Max length : 35.0 cm SL male/unsexed; [De Vos 2003]; max. published weight: 250.00 g [Ita 1984]; max. reported age: 7 years [Skelton 1993]”

“May live up to 6-7 years [Skelton 1993]. Max total length 40.0mm [De Vos 1986].”

Environment

From Froese and Pauly (2019):

“Freshwater; demersal; potamodromous [Riede 2004]; depth range 4 - 69 m. [...]; 23°C - 27°C [Riehl and Baensch 1991; assumed to be recommended aquarium temperature]; [...].”

“Lacustrine as well as fluviatile species, confined to lakes and moderate to large rivers [De Vos 1995].”

From Azeroual et al. (2010):

“It shoals in standing or slowly flowing open water with emergent or submerged vegetation. Occasionally in sandy streams, occasionally on rocky streams, common in standing deep water, abundant in shallow swamps, and occasionally in shallow flood plains. The species adapts to running and stagnant waters.”

Climate/Range

From Froese and Pauly (2019):

“Tropical; [...]; 25°N - 27°S, 17°W - 45°E”

Distribution Outside the United States

Native

From Froese and Pauly (2019):

“Africa: Nilo-Sudanese species, known from the Nile basin and in West Africa from the Senegal River eastwards to the Cross, Wouri and Sanaga River, including the Chad basin [De Vos 1995]. Various reports, including from the Ogowe and Congo River basin or Zambia and Zimbabwe, are based on misidentifications [De Vos 1995]. Reports from Angola and Tanzania are questionable and need confirmation.”

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“Reports of *Schilbe mystus* from the Caprivi [Namibia] [van der Waal and Skelton 1984] refer to *Schilbe intermedius* [De Vos 1995].”

“[In Zambia:] Reports of *Schilbe mystus* from Lake Kariba [Losse 1998], Lake Itzhi-tezhi [Kapasa and Cowx 1991] and Luongo River [Balon and Stewart 1983] refer to *Schilbe intermedius* [De Vos 1995].”

“Reports of *Schilbe mystus* from Zimbabwe [Bell-Cross and Minshull 1988] refer to *Schilbe intermedius* [De Vos 1995].”

Introduced

From CABI (2015):

“Only one recorded introduction, to China, is available. A previous introduction into the Congo River Basin, through natural diffusion from neighbouring countries, was based on misidentification of *S. grenfelli* according to De Vos (1995). There are very few recorded impacts of this species.”

From Froese and Pauly (2019):

“Reportedly introduced [in the Congo] [FAO 1997]. Reported from Pool Malebo [Mady-Goma Dirat et al. 2008], but according to [De Vos 1995], all reports of the species from the Congo basin are based on misidentifications of closely related species.”

Means of Introduction Outside the United States

From CABI (2015):

“The one recorded introduction was to China in 1976 from Sudan, by government authorities for aquacultural purposes. There is, however, no information on whether this introduction was successful.”

Short Description

From Froese and Pauly (2019):

“Dorsal spines (total): 1; Dorsal soft rays (total): 6. Diagnosis: adipose fin present [De Vos 1995, 2003, 2007] and fully developed [De Vos 2003, 2007]. Anterior nostrils more closer [*sic*] to each other than to posterior ones; inner margin of pectoral-fin spine strongly denticulate posteriorly [De Vos 1995, 2003, 2007]. Nasal barbel reaching to anterior eye margin [De Vos 2003, 2007], but never extending beyond posterior margin of eye [De Vos 1995, 2003, 2007]. Mouth subterminal [De Vos 2003, 2007], snout reaching beyond lower jaw [De Vos 1995]. 45-64 branched anal-fin rays and 8-15 gill rakers on lower limb of first gill arch [De Vos 1995, 2003, 2007].”

“Description: 10 branchiostegal rays on one side of head; caudal peduncle longer than deep. nasal and inner mandibular barbel never reach beyond posterior border of eye; maxillary barbel at least reaches to anterior border of eye and at maximum to just beyond posterior border of opercle; outer mandibular barbel at maximum reaches to just beyond anterior border of opercle; posterior border of dorsal spine feebly serrated [De Vos 1995]. *Schilbe mystus* is, in many respects, strikingly similar to *S. grenfelli*, and also seems closely related to *S. banguelensis* and *S. nyongensis*, both species with the anterior nostrils closer to each other than the posterior ones and with a rather small inferior mouth; *S. grenfelli* and *S. mystus* are allopatric species, the inner side of the pectoral spine being finely serrated in the former while coarsely serrated in the latter; in *S. banguelensis* the nasal barbel always reaches beyond the orbit and the inner side of the pectoral spine is feebly serrated; in *S. nyongensis* the nasal barbel always reaches beyond the orbit while it never reaches beyond the eye in *S. mystus* [De Vos 1995].

Coloration: ground colour generally silvery-white; head and back brownish, fins usually colourless [De Vos 2003] or pale yellow [De Vos 2007], sometimes tinged with black [De Vos 1995]. Flanks and belly usually whitish, silver [De Vos 2007].”

“Male papilla short relative to anal fin length and may be confused with female papilla which, however, is frequently concealed in the ano-genital groove; in juveniles of less than 150 mm total length, correlation between genital papilla and sex was poor (50 %), but the overall correlation for 198 specimens was 80% [De Vos 1995].”

Biology

From Froese and Pauly (2019):

“Shoals in standing or slowly flowing open water with emergent or submerged vegetation. Generally more active at night or in subdued light. Feed from mid-water and surface waters on a wide variety of foods including fish, insects, shrimps, snails, plant seeds, and fruit. Oviparous, eggs are unguarded [Breder and Rosen 1966]. Often important spawning migrations occur [De Vos 1995]. Breed during the rainy season and may be either a single or multiple spawner in different localities, laying eggs on vegetation.”

“Distinct pairing [Breder and Rosen 1966].”

From Azeroual et al. (2010):

“*Schilbe mystus* migrates into the tributaries of rivers and streams during the rainy season to breed and may be either a single or multiple spawner in different localities, laying eggs on vegetation. Spawning occurs during September and October.”

Human Uses

From Froese and Pauly (2019):

“Fisheries: commercial; gamefish: yes; aquarium: commercial”

“Exploited commercially in Kainji Lake [Anonymous 1998].”

“Also caught with drawnets. In general considered as a flavoured, first class eating fish [De Vos 1995].”

“Species very prized by consumers. Game fish very good when consumed fresh, refrigerated, smoked, dried but loses taste once frozen. Farming biotechnology is not known.”

From Azeroual et al. (2010):

“This species is well marketable when caught (Bishai and Khalil 1997). *Schilbe mystus* is an important food fish. It is also used as an aquarium fish.”

Schilbe mystus is listed as a Noxious Fish in Australia (Natural Resource Management Ministerial Council 2006).

From CABI (2015):

“The one recorded introduction was to China in 1976 from Sudan, by government authorities for aquacultural purposes. There is, however, no information on whether this introduction was successful.”

Diseases

No records of OIE reportable diseases (OIE 2019) were found.

From Froese and Pauly (2019):

“Contracecum Disease (larvae), Parasitic infestations (protozoa, worms, etc.)
Schilbetrema Infestation 1, Parasitic infestations (protozoa, worms, etc.)
Schilbetrema Infestation 2, Parasitic infestations (protozoa, worms, etc.)”

Poelen et al. (2014) list *Schilbetrema acornis*, *S. aegyptica*, *S. calamocleithrum*, *S. quadricornis*, *S. undinula*, and *S. vacillans* as parasites of *Schilbe mystus*.

Fomena et al. (2017) found *Thelohanellus njinei* n. sp. as a gut parasite of *Schilbe mystus*.

From Kritsky and Kulo (1992):

“[...] *S[chilbetrema]. hexacornis* Paperna, 1969, *S. eutropii* Paperna, 1969, *S. spirocirra* Paperna, 1969, and *S. torula* n. sp. from *Schilbe mystus*; [...]”

Threat to Humans

From Froese and Pauly (2019):

“Harmless”

3 Impacts of Introductions

From CABI (2015):

“Only one recorded introduction, to China, is available. A previous introduction into the Congo River Basin, through natural diffusion from neighbouring countries, was based on misidentification of *S. grenfelli* according to De Vos (1995). There are very few recorded impacts of this species.”

4 Global Distribution



Figure 1. Known global distribution of *Schilbe mystus*. Observations reported across much of Africa. Map from GBIF Secretariat (2019). Locations in Republic of the Congo, Democratic Republic of the Congo (except for those from Lake Albert), Kenya, Tanzania, Angola, Namibia, Zimbabwe, Zambia, Botswana, Mozambique, and South Africa were not used to select source points for the climate match as they are most likely misidentifications of the closely related *S. intermedius* (CABI 2015; Froese and Pauly 2019).

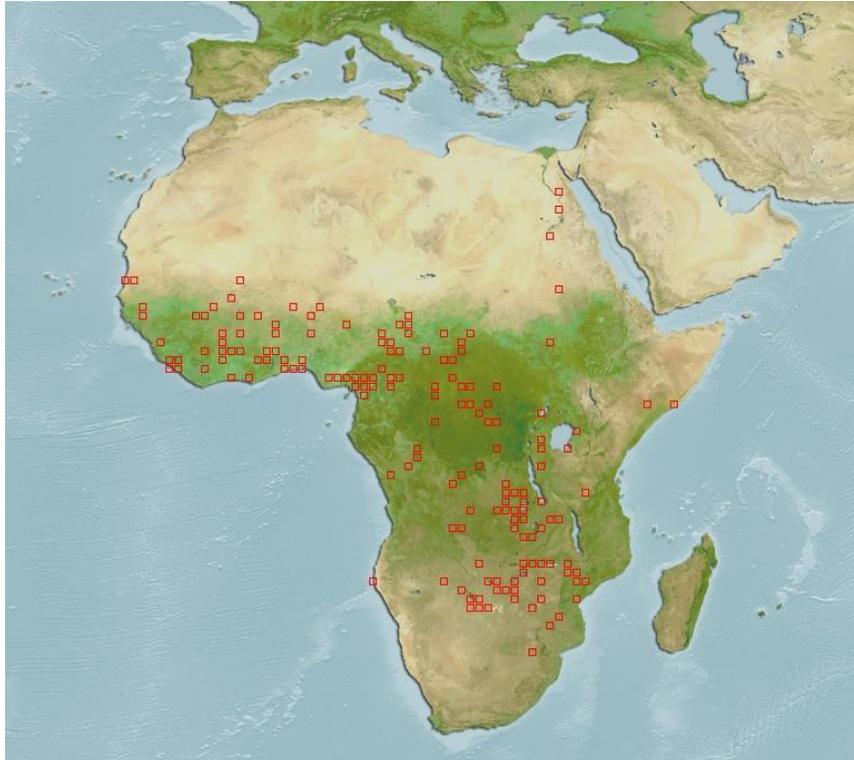


Figure 2. Additional known global distribution of *Schilbe mystus*. Observations reported across much of Africa. Map from Froese and Pauly (2019). Locations in the Republic of the Congo and

central Democratic Republic of the Congo are from a congener that was misidentified and were not used to select source points for the climate match. Locations in Republic of the Congo, Democratic Republic of the Congo (except for those from Lake Albert), Kenya, Tanzania, Angola, Namibia, Zimbabwe, Zambia, Botswana, Mozambique, and South Africa were not used to select source points for the climate match as they are most likely misidentifications of the closely related *S. intermedius* (CABI 2015; Froese and Pauly 2019).

Additional georeferenced observations were available from VertNet (2017). It is unknown if the introduction into China resulted in an established population. No georeferenced observations were available from China.

5 Distribution Within the United States

No records of *Schilbe mystus* in the United States were found.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Schilbe mystus* was medium to high in the Southwest and the southern tip of Florida. The match was medium along the southern border with Mexico, along the Pacific Coast, in parts of the Texas Gulf Coast and most of Florida. It was low everywhere else. The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.034, medium. (Scores between 0.005 and 0.103 are classified as medium.) Most States had low individual Climate 6 scores, except for Arizona, California, and Florida, which had high scores, and Nevada, which had a medium score.

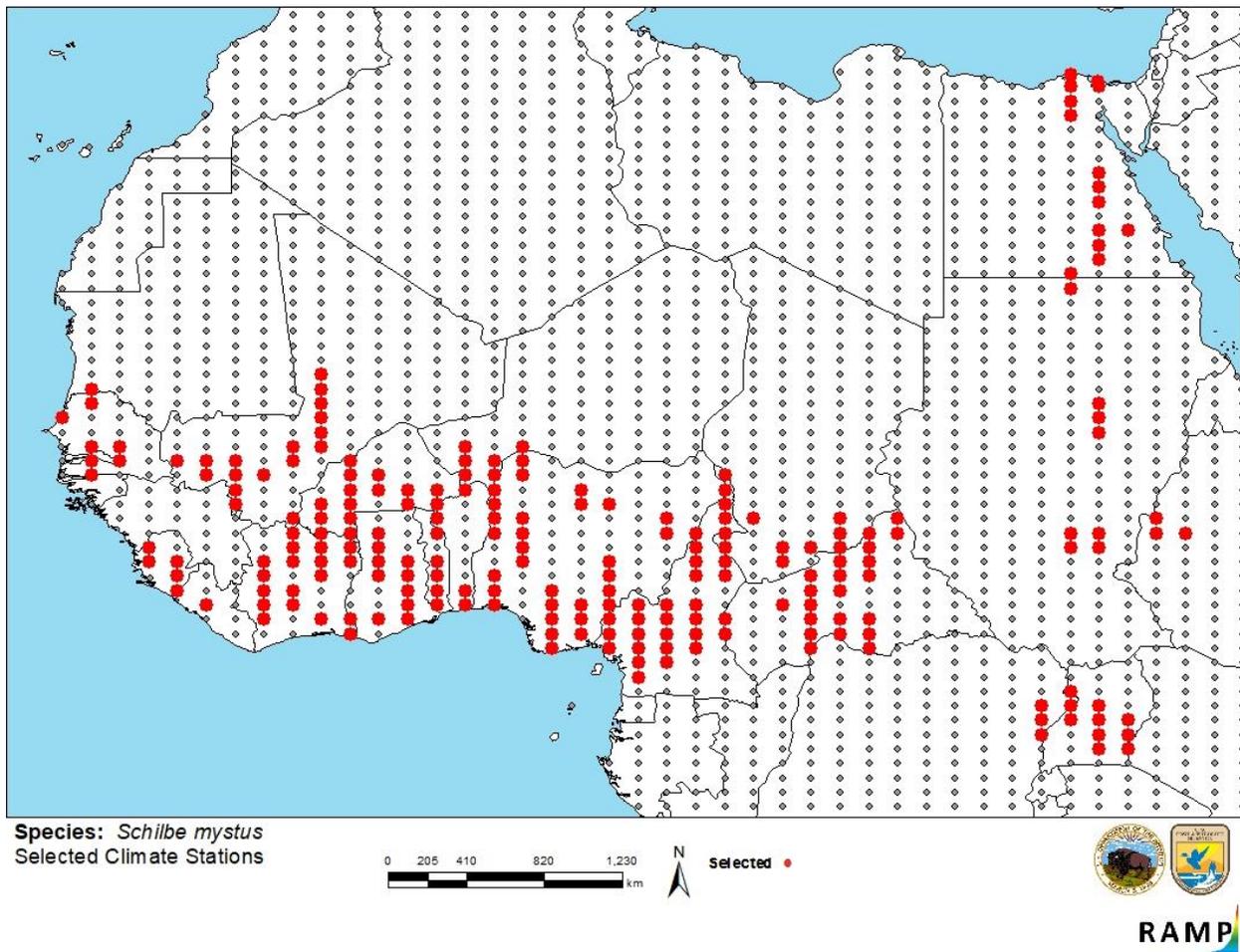


Figure 3. RAMP (Sanders et al. 2018) source map showing weather stations selected in Africa as source locations (red) and non-source locations (grey) for *Schilbe mystus* climate matching. Source locations from CABI (2015), VertNet (2017), GBIF Secretariat (2019), and Froese and Pauly (2019). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves. Observations in southern Africa and in eastern Africa outside of the stated native range (Nile River basin) were not used as source points for the climate match as those points most likely pertain to closely related species and not *Schilbe mystus* (see section 1 for full description of native range and misidentifications).

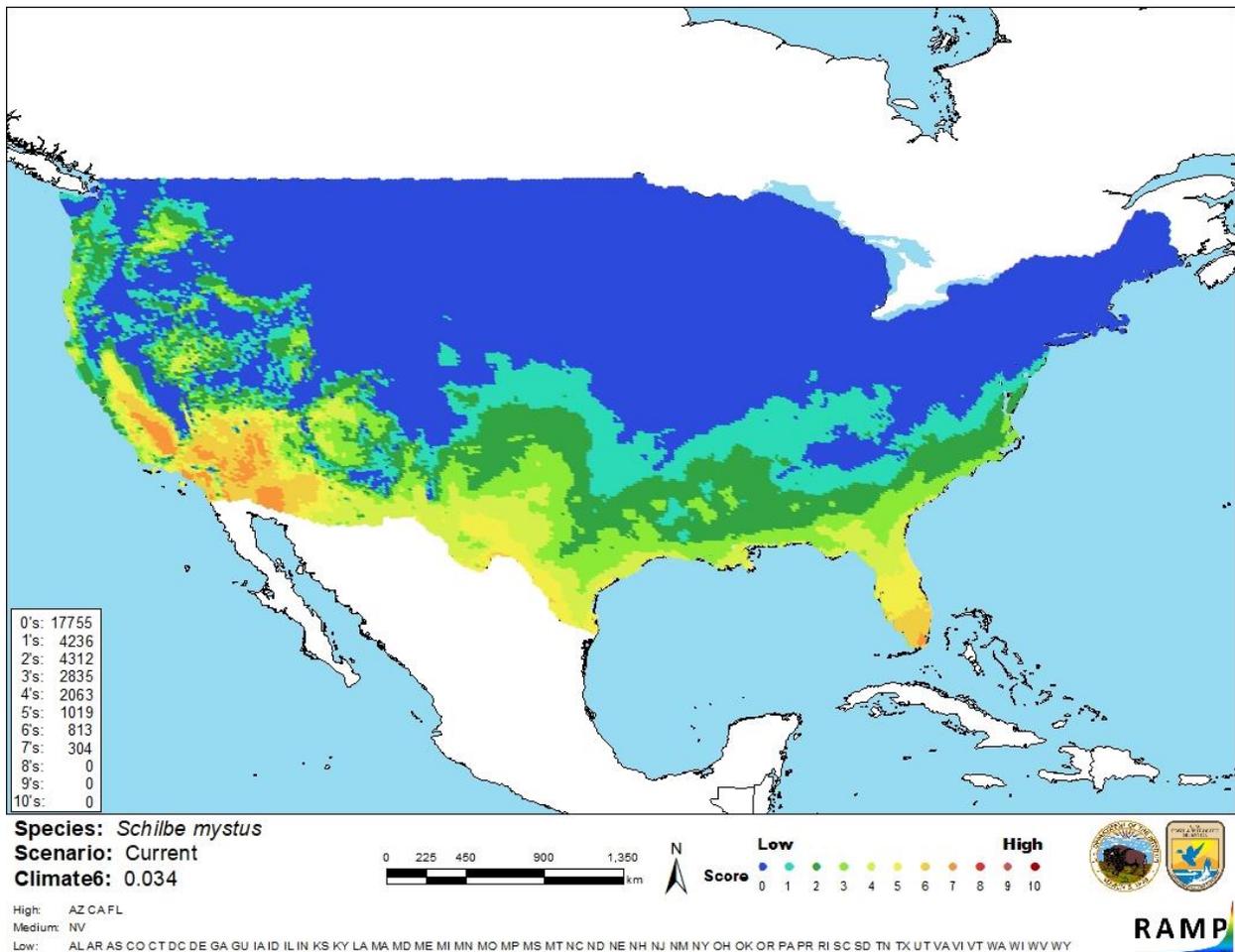


Figure 4. Map from RAMP (Sanders et al. 2018) of a current climate match for *Schilbe mystus* in the contiguous United States based on source locations reported by CABI (2015), VertNet (2017), GBIF Secretariat (2019), and Froese and Pauly (2019). 0 = Lowest match, 10 = Highest match.

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

7 Certainty of Assessment

The certainty of this assessment is low. A good amount of biological and ecological information was available for *Schilbe mystus*. A couple of records of introduction were found; one had no detailed information (China) and the other is thought to be mistaken identification. The

distribution of the species is potentially not clear. Many maps still contain references to populations in southern Africa; those populations have been determined to be a separate species.

8 Risk Assessment

Summary of Risk to the Contiguous United States

African Butter Catfish (*Schilbe mystus*) is native to many of the large river systems in Western Africa and the Nile River system. *S. mystus* is used for food and supports a commercial fishery; it is also found in the aquarium industry. At one point *S. mystus* was considered to be more widely spread in Africa but it is now known that many populations, particularly those in southern Africa, belong to other *Schilbe* species. The history of invasiveness is uncertain. Only one confirmed record of introduction (to China) was found and it is unknown if that became an established population. No information on any impacts from that introduction were found. The overall climate match is medium. Areas of high match could be found in the southwest and far southern Florida. The certainty of assessment is low due to the lack of information on introductions and impacts. The overall risk assessment category is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): Uncertain**
- **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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