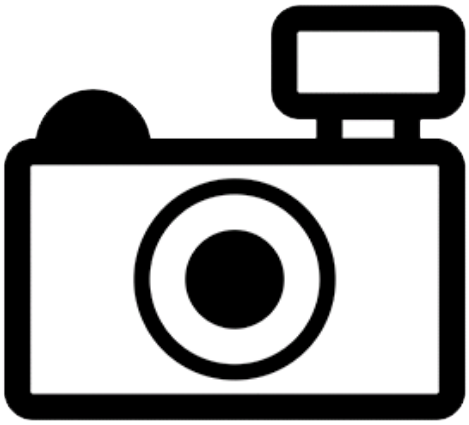
Martenstyn's Barb (*Systomus martenstyni*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, August 2013
Revised, August 2018
Web Version, 6/25/2019



No Photo Available

1 Native Range and Status in the United States

Native Range

From Rajakaruna et al. (2015):

"*Systomus martenstyni* has been recorded in the two principal tributaries of Amban Ganga, Kalu Ganga and Sudu Ganga, at elevations between about 150 m and 500 m, and it has not been recorded from anywhere else in Sri Lanka (Pethiyagoda 1991)."

"Two isolated populations of *S. martenstyni* were recorded at Loggal Oya (07°13′60″ N, 081°01′00″ E) and Badulu Oya (07°13′00″ N, 081°00′0″ E) [in Sri Lanka] during the study […]"

From Kottelat and Pethiyagoda (1991):

"Holotype. […] Sri Lanka: Matale District: Mahaweli River basin: Kalu River, about 2 km North of Pallegama (Laggala-Pallegama), 7°33'N, 80°50'E; […]"

Status in the United States

This species has not been reported as introduced or established to the United States, and there is no information available indicating that it is in trade in the United States.

Means of Introductions in the United States

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

Remarks

The current accepted name for this species is *Systomus martenstyni*. The synonym *Puntius martenstyni* is also commonly used, so both names were used when searching for information in preparation of this report.

From Pethiyagoda (1996):

"[IUCN] Red List Category & Criteria: Endangered […]"

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From Froese and Pauly (2019a):

"Biota > Animalia (Kingdom) > Chordata (Phylum) > Vertebrata (Subphylum) > Gnathostomata (Superclass) > Pisces (Superclass) > Actinopterygii (Class) > Cypriniformes (Order) > Cyprinidae (Family) > Barbinae (Subfamily) > *Systomus* (Genus) > *Systomus martenstyni* (Species)"

From Eschmeyer et al. (2018):

"Current status: Valid as *Systomus martenstyni* (Kottelat & Pethiyagoda 1991). Cyprinidae: Smiliogastrinae."

Size, Weight, and Age Range

From Froese and Pauly (2019b):

"Max length : 25.0 cm TL male/unsexed; [Pethiyagoda 1991]"

Environment

From Froese and Pauly (2019b):

"Freshwater; benthopelagic."

Climate/Range

From Froese and Pauly (2019b):

"Tropical; 8°N - 7°N"

Distribution Outside the United States

Native

From Rajakaruna et al. (2015):

"*Systomus martenstyni* has been recorded in the two principal tributaries of Amban Ganga, Kalu Ganga and Sudu Ganga, at elevations between about 150 m and 500 m, and it has not been recorded from anywhere else in Sri Lanka (Pethiyagoda 1991)."

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"Holotype. […] Sri Lanka: Matale District: Mahaweli River basin: Kalu River, about 2 km North of Pallegama (Laggala-Pallegama), 7°33'N, 80°50'E; […]"

Introduced

This species has not been reported as introduced or established outside of its native range.

Means of Introduction Outside the United States

This species has not been reported as introduced or established outside of its native range.

Short Description

From Rajakaruna et al. (2015):

"The collected species present a colour pattern consisting of a black blotch on caudal peduncle and six rows of black blotches along sides. The head and body were yellowish brown, darker on the back, yellowish or whitish in belly. All fins comprised of dark grey rays and hyaline membranes. The tips of pelvic, anal and caudal fins were orange-red; anterior rays of pelvic and anal fins were whitish and the tip of the dorsal fin was orange-red […]. Dorsal fin originates over ninth scale of lateral line with four simple rays and eight to nine branched rays. Anal fin with three simple and five branched rays, pectoral fin with one simple and 15 branched rays, pelvic fin with one simple and eight branched rays. Lateral line was complete with 27–29 perforated scales on body, 10–11 pre dorsal scales, 3 scales between lateral line and pelvic fin origin giving the fin formula; D IV.8–9; A III.5; P I.15; V I,8; LL 27–29; L. lat 5½/3½."

From Kottelat and Pethiyagoda (1991):

"No sexual dimorphism was observed."

Biology

From Kottelat and Pethiyagoda (1991):

"Juveniles of *P. martenstyni* (<5 cm SL) were found to occur mainly in the shallow (< 1 m) areas of larger streams, where the stream bed comprised sand or gravel […]. The flow in these areas was slow to moderate ($<0.5 ms^{-1}$), the stream being partially shaded by marginal trees. The smaller fishes did not appear to have any spatial preference within the stream; no schooling behavior was observed."

"Larger specimens were found in small groups of 5-10 individuals, inhabiting relatively deep (1m < d < 5 m) rock pools at the bottom of cascades, usually sheltering behind boulders in very swift flow […]. These habitats, by and large, had no shade whatever. Large (> 10 cm SL) specimens were also observed loosely schooling in shallower water (< 1 m) in boulder-strewn parts of streams with moderate flow, but only where refuge in the form of a nearby cascade-pool was available."

Human Uses

From Froese and Pauly (2019b):

"Fisheries: commercial"

From Kottelat and Pethiyagoda (1991):

"[…] larger specimens are regularly fished for with cast-nets."

From Rajakaruna et al. (2015):

"At Badulu Oya and Loggal Oya the habitats preferred by *S. martenstyni* are also highly threatened due to human activities such as […] uncontrolled fishing in these tributaries using cast nets, dynamiting, fish poisoning with *Derris scandens* roots (a plant which is poisonous to fish)."

Diseases

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

Threat to Humans

From Froese and Pauly (2019b):

"Harmless"

3 Impacts of Introductions

This species has not been reported as introduced or established outside of its native range.

4 Global Distribution

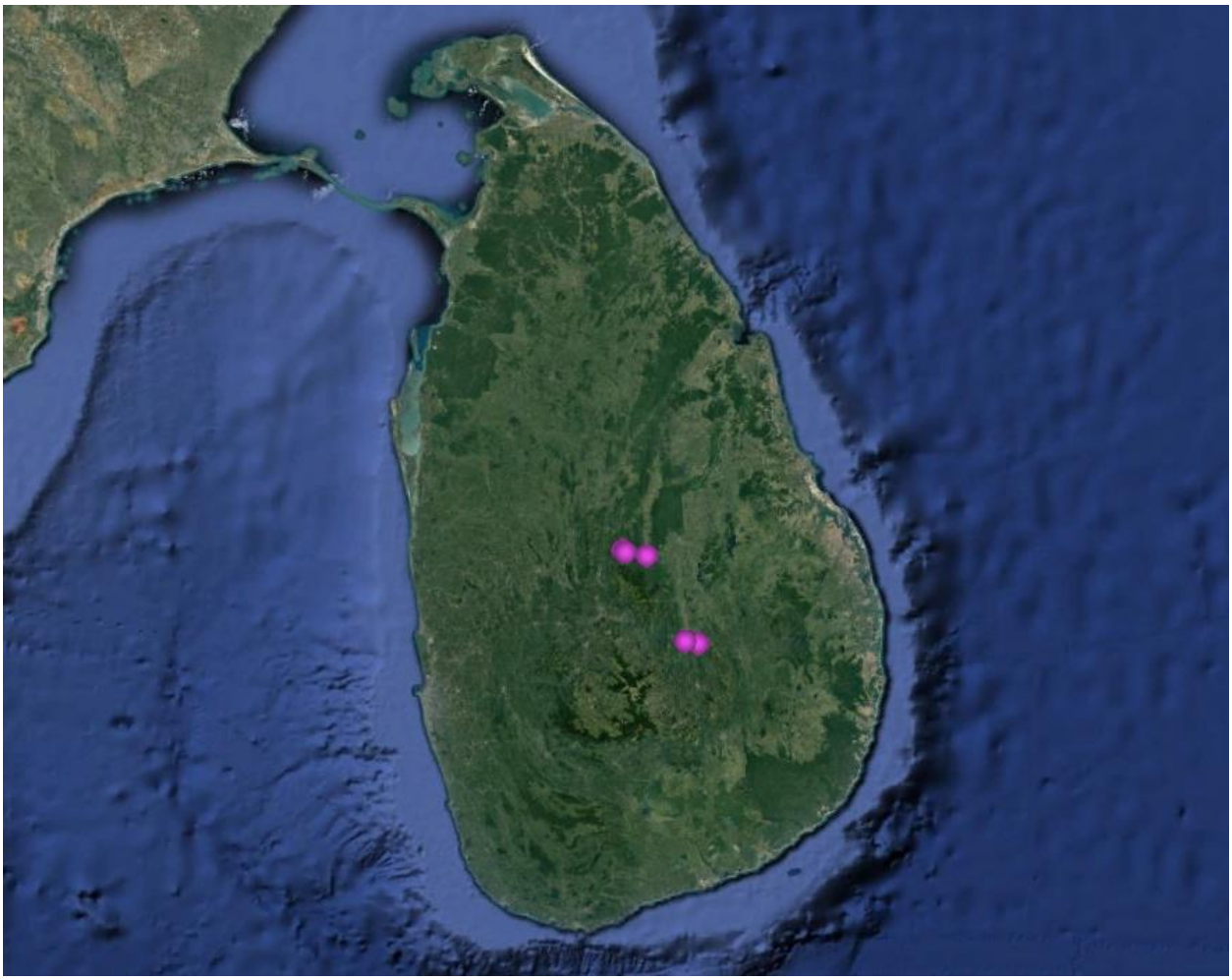

Figure 1. Known global distribution of *Systomus martenstyni* in the Mahaweli River basin in Sri Lanka based on source locations reported by Kottelat and Pethiyagoda (1991) and Rajakaruna et al. (2015). Map made with Google Earth Pro 7.3.1.4507 (Google LLC, Mountain View, California).

5 Distribution Within the United States

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

6 Climate Matching

Summary of Climate Matching Analysis

The Climate 6 score (Sanders et al. 2014; 16 climate variables; Euclidean distance) for the contiguous United States was 0.0, which is a low climate match. Scores between 0.000 and 0.005, inclusive, are classified as low. All areas of the contiguous United States had a low climate match except southern peninsula Florida. The climate score was medium in Florida, and low in all other states.

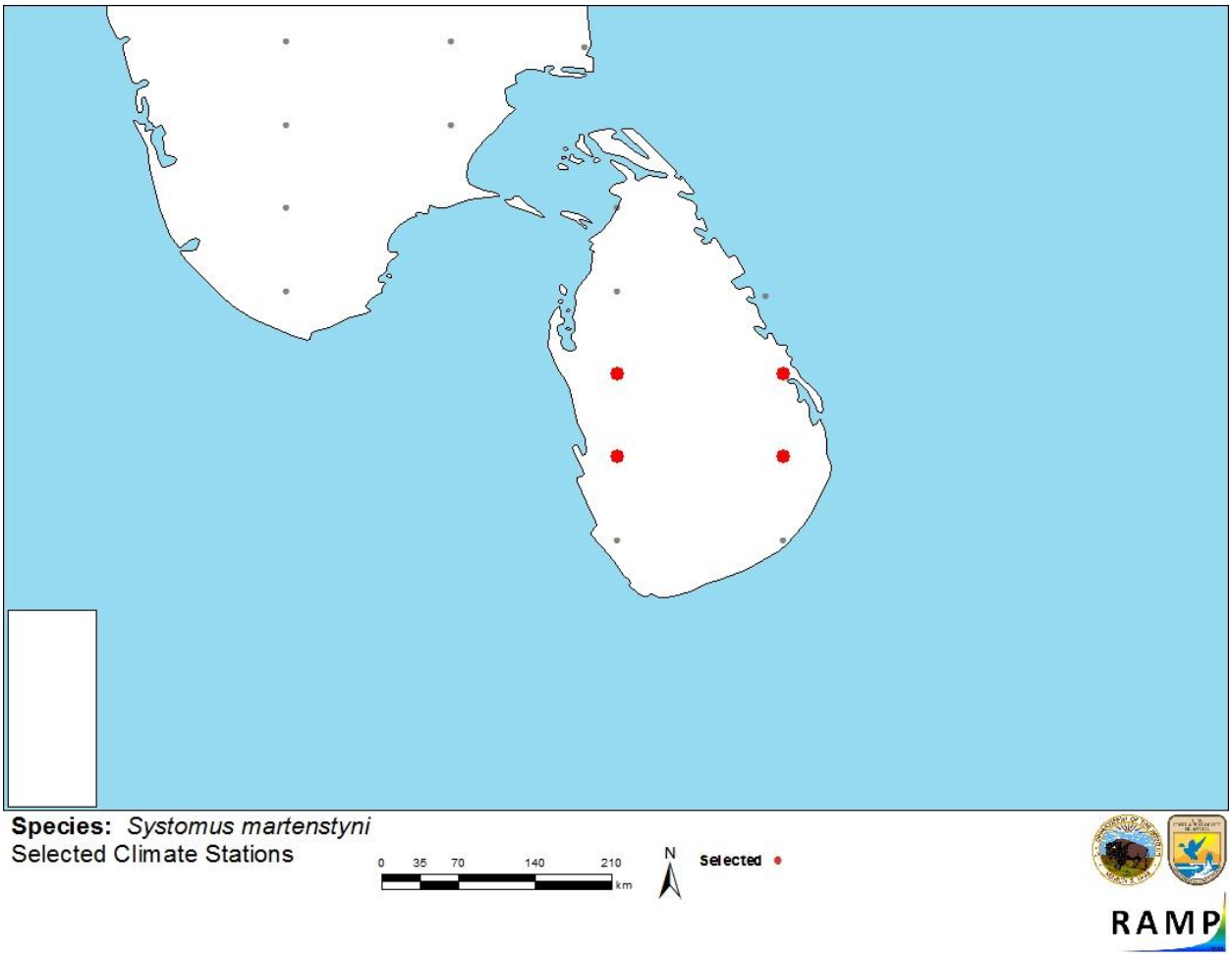

Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red; Sri Lanka) and non-source locations (gray) for *Systomus martenstyni* climate matching. Source locations from Kottelat and Pethiyagoda (1991) and Rajakaruna et al. (2015).

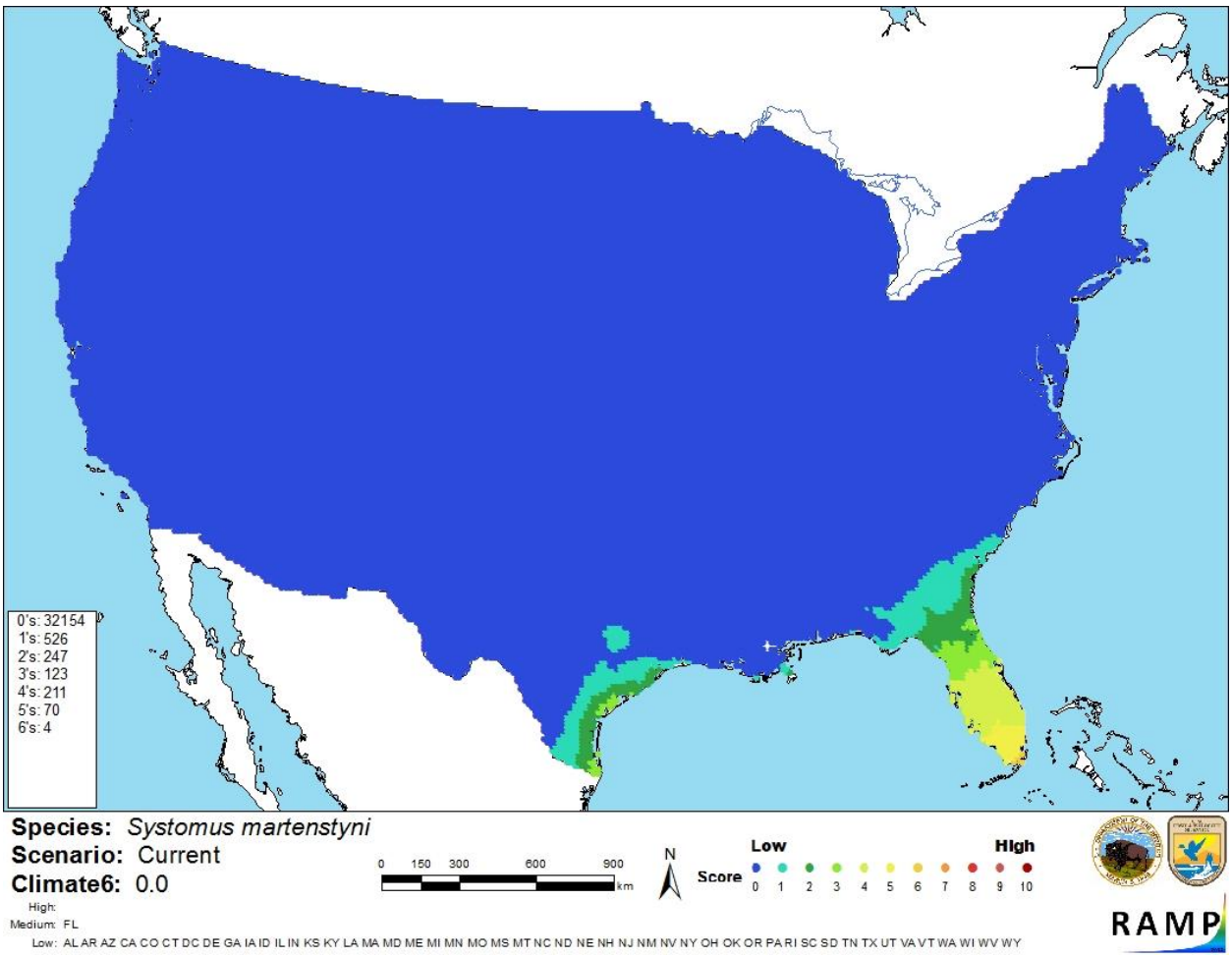

Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *Systomus martenstyni* in the contiguous United States based on source locations reported by Kottelat and Pethiyagoda (1991) and Rajakaruna et al. (2015). 0= Lowest match, 10=Highest match.

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

There is adequate information available about the biology of *Systomus martenstyni*. Its range is limited but has been well-documented. This species has never been reported as introduced or established outside of its native range, however, so no impacts of introductions have been documented from which to base an assessment of risk. Because of this, the certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Systomus martenstyni, Martenstyn's Barb, is a small cyprinid native to the Mahaweli River basin in central Sri Lanka, where it is harvested as a fish food. It has only been collected at a few points in its overall range, and it is listed as an endangered species on the IUCN Red List. *S. martenstyni* has never been reported as introduced or established outside of its native range. History of invasiveness is uncertain. This species has a low climate match with the contiguous United States overall, but a medium climate match in southern Florida. Certainty of this assessment is low because of a lack of information about the invasive potential of this species. The overall risk assessment category is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): Uncertain**
- **Climate Match (Sec. 6): Low**
- **Certainty of Assessment (Sec. 7): 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.

Eschmeyer, W. N., R. Fricke, and R. van der Laan, editors. 2018. Catalog of fishes: genera, species, references. Available: http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp. (August 2018).

Froese, R., and D. Pauly, editors. 2019a. *Systomus martenstyni* (Kottelat & Pethiyagoda, 1991). *In* World Register of Marine Species. Available: http://www.marinespecies.org/aphia.php?p=taxdetails&id=1011345. (June 2019).

Froese, R., and D. Pauly, editors. 2019b. *Systomus martenstyni* (Kottelat & Pethiyagoda, 1991). FishBase. Available: https://www.fishbase.de/summary/Systomus-martenstyni.html. (June 2019).

ITIS (Integrated Taxonomic Information System). 2018. *Puntius martenstyni* (Kottelat and Pethiyagoda, 1991). Integrated Taxonomic Information System, Reston, Virginia. Available: https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=689824#null. (August 2018).

Kottelat, M., and R. Pethiyagoda. 1991. Descriptions of three new species of cyprinid fishes from Sri Lanka. Pages 299-313 *in* R. Pethiyagoda, editor. Freshwater fishes of Sri Lanka. Wildlife Heritage Trust of Sri Lanka, Colombo, Sri Lanka.

Pethiyagoda, R. 1996. *Systomus martenstyni*. The IUCN Red List of Threatened Species 1996: e.T18908A8676112. Available: http://www.iucnredlist.org/details/18908/0. (August 2018).

Rajakaruna, S. L., G. Ellepola, T. Gunaratne, Su. Madawala, and K. Ranawana. 2015. Two new localities of the endangered fish *Systomus martenstyni* (Kottelat & Pethiyagoda, 1991) (Teleostei: Cyprinidae) found in Sri Lanka. Check List 11(3):1622.

Sanders, S., C. Castiglione, and M. H. Hoff. 2014. Risk Assessment Mapping Program: RAMP. U.S. Fish and Wildlife Service.

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.

Pethiyagoda, R. 1991. Freshwater fishes of Sri Lanka. The Wildlife Heritage Trust of Sri Lanka, Colombo, Sri Lanka.