

Black Ruby Barb (*Pethia nigrofasciata*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, web version – 4/3/2018



Photo: Derek Ramsey. Licensed under Creative Commons BY-SA 2.5 Generic. Available: https://commons.wikimedia.org/wiki/File:Black_Ruby_Barb_700.jpg.

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2016):

“Asia: restricted to forest streams from the Kelani to Nilwala basins in Sri Lanka.”

Status in the United States

No records of *Pethia nigrofasciata* in the United States were found.

Means of Introductions in the United States

No records of *Pethia nigrofasciata* in the United States were found.

Remarks

Different sources list *Pethia nigrofasciata* (Froese and Pauly 2016; Eschmeyer et al. 2017) or *Puntius nigrofasciatus* (ITIS 2016) as the accepted senior synonym. Information searches were conducted using both names.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From Eschmeyer et al. (2017):

“*nigrofasciatus*, *Barbus* Günther [A.] 1868:155 [Catalogue of the fishes in the British Museum v. 7; [...]] Southern Sri Lanka. Syntypes: (at least 12) BMNH 1854.5.31.49, 1854.5.31.53, 1858.10.19.99-101, 1864.7.11.29-31; ZMB 4835 (1), 6304 (2). •Valid as *Puntius nigrofasciatus* (Günther 1868) -- (Pethiyagoda 1991:109 [...], Talwar & Jhingran 1991:276 [...], Kullander & Fang 2005:297 [...], Silva et al. 2008:62 [...], Kullander & Britz 2008:61 [...], Meegaskumbura et al. 2008:151 [...]). •Valid as *Pethia nigrofasciata* (Günther 1868) -- (Pethiyagoda et al. 2012:81 [...], Katwate et al. 2014:5814 [...], Katwate et al. 2014:213 [...], Batuwita et al. 2015:580 [...]). **Current status:** Valid as *Pethia nigrofasciata* (Günther 1868). Cyprinidae: Cyprininae.”

From ITIS (2016):

“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 *Puntius*
Species *Puntius nigrofasciatus* (Günther, 1868)”

Froese and Pauly (2016) list the following as synonyms of *Pethia nigrogasciata*: *Barbus nigrofasciatus* Günther, 1868, and *Puntius nigrafasciatus* (Günther, 1868).

Size, Weight, and Age Range

From Froese and Pauly (2016):

“Max length: 6.0 cm TL male/unsexed; [Axelrod et al. 1991]; 6.7 cm TL (female)”

Environment

From Froese and Pauly (2016):

“Freshwater; benthopelagic; pH range: 6.0 - 6.5; dH range: 5 - 12. [...]; 22°C - 26°C [assumed to be recommended aquarium temperature range] [Riehl and Baensch 1991]; [...].”

“It occurs in hilly areas up to about 300 m elevation.”

“Inhabits clear, cool, shady streams in forested areas, on gravel or sand substrate. Sometimes found in pools of quiet water in the margins of clear streams and rivers [Schut et al. 1984].”

Climate/Range

From Froese and Pauly (2016):

“Tropical; [...]; 8°N - 6°N”

Distribution Outside the United States

Native

From Froese and Pauly (2016):

“Asia: restricted to forest streams from the Kelani to Nilwala basins in Sri Lanka.”

Introduced

From Froese and Pauly (2016):

“The brightly colored population introduced to Mahaweli at Ginigathena, Sri Lanka are said to have diminished in number due to the aquarium export trade.”

From FAO (2016):

“*Puntius nigrofasciatus* introduced to Colombia from Sri Lanka”

“Date of introduction: unknown”

“Status of the introduced species in the wild: Established”

From Magalhães and Jacobi (2013):

“Among the 65 non-native aquarium fish currently found in Brazilian inland waters are seven cyprinids, the goldfish *C. auratus*, koi carp *Cyprinus rubrofasciatus* Lacepede de 1803, zebrafish *Danio rerio* (Hamilton 1822), Malabar danio *Devario malabaricus* (Jerdon 1849), Arulius barb

Dawkinsia tambraparniei (Silas 1954), rosy barb *Pethia conchonius* (Hamilton 1822), black ruby barb *Pethia nigrofasciata* (Günther 1868),”

Means of Introduction Outside the United States

From FAO (2016):

“Reasons of Introduction: 1) ornamental”

Short Description

From Butler (2016):

“A high-backed, deep bodied fish that lacks barbels. The head is dark crimson red in color and the flanks are marked with three to four, dark transverse bars. The first is located above the eye, while the last is located near the caudal penuncle. The back is usually dark copper brown. The body coloration depends on the sex. In the spawning season, males have a bright crimson red body and a red caudal fin. Females have yellowish orange-gray coloring with a peach colored caudal fin. The other fins on both sexes are black. Males in normal dress resemble females, although they are brighter in color.”

Biology

From Froese and Pauly (2016):

“Spawns in shallow water among marginal weeds. Eggs (>100) hatch in 1-2 days; fry are free-swimming after 24 h [De Silva et al.1985]. Feeds mainly on filamentous algae and detritus [Moyle and Senanayake 1984]. Males brightly colored and with darker fins.”

Human Uses

From Froese and Pauly (2016):

“Popular aquarium fish. Aquarium keeping: in groups of 5 or more individuals; minimum aquarium size 80 cm [BMELF 1999].”

Diseases

No records of OIE reportable diseases were found.

From Froese and Pauly (2016):

“White spot Disease, Parasitic infestations (protozoa, worms, etc.)
Velvet Disease, Parasitic infestations (protozoa, worms, etc.)
Bacterial Infections (general), Bacterial diseases
Fin-rot Disease (late stage), Bacterial diseases
Fin Rot (early stage), Bacterial diseases
Ichthyobodo Infection, Parasitic infestations (protozoa, worms, etc.)”

Threat to Humans

From Froese and Pauly (2016):

“Harmless”

3 Impacts of Introductions

The following details potential impacts of a *Pethia nigrofasciata* introduction.

From Magalhães and Jacobi (2013):

“Competition for food is possible between the non-native cyprinids *C. auratus*, *C. rubrofasciatus*, *D. tambraparniei*, *P. conchoniensis* and *P. nigrofasciata*, and the native cichlids *G. obscurus* and *A. muriae*, since they are all omnivorous and usually live in the deep layer of streams (Froese and Pauly 2007; Menezes et al. 2007).”

4 Global Distribution



Figure 1. Known global distribution of *Pethia nigrofasciata*. Locations are in Sri Lanka. Map from GBIF Secretariat (2017).

Magalhães and Jacobi (2013) report the location of an established population of *Pethia nigrofasciata* in the Glória Reservoir and River in Minas Gerais state in southeastern Brazil.

The population reported in Colombia does not have any accompanying location data and was not used as a source population in the climate match.

5 Distribution Within the United States

No records of *Pethia nigrofasciata* in the United States were found.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Pethia nigrofasciata* was medium in a small portion of southern Florida and low everywhere else. The Climate 6 score (Sanders et al. 2014; 16 climate variables; Euclidean distance) for the contiguous U.S. was 0.000, low, and no states had an individually high climate match.

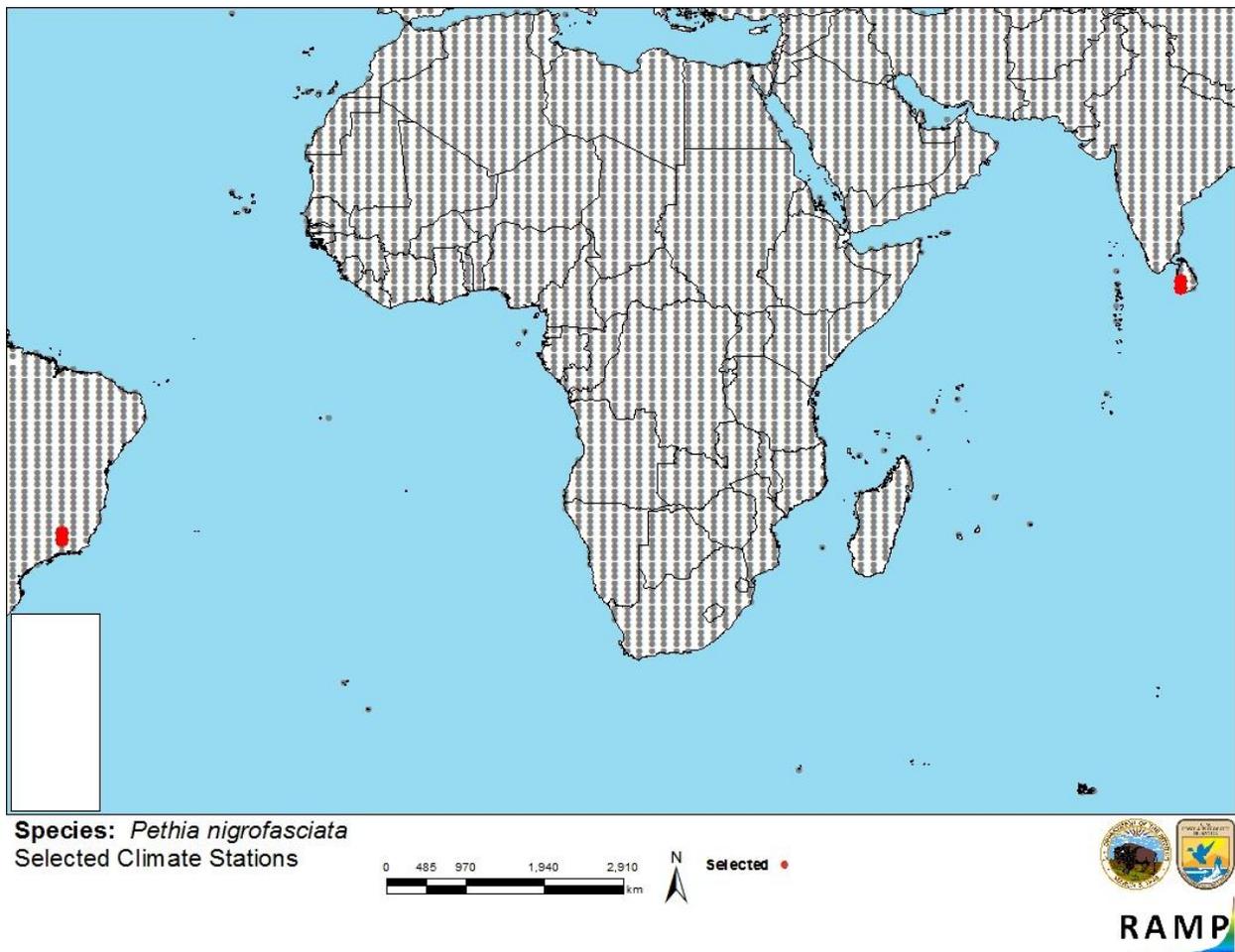


Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations in Brazil and Sri Lanka selected as source locations (red) and non-source locations (grey) for *Pethia nigrofasciata* climate matching. Source locations from Magalhães and Jacobi (2013) and GBIF Secretariat (2017).

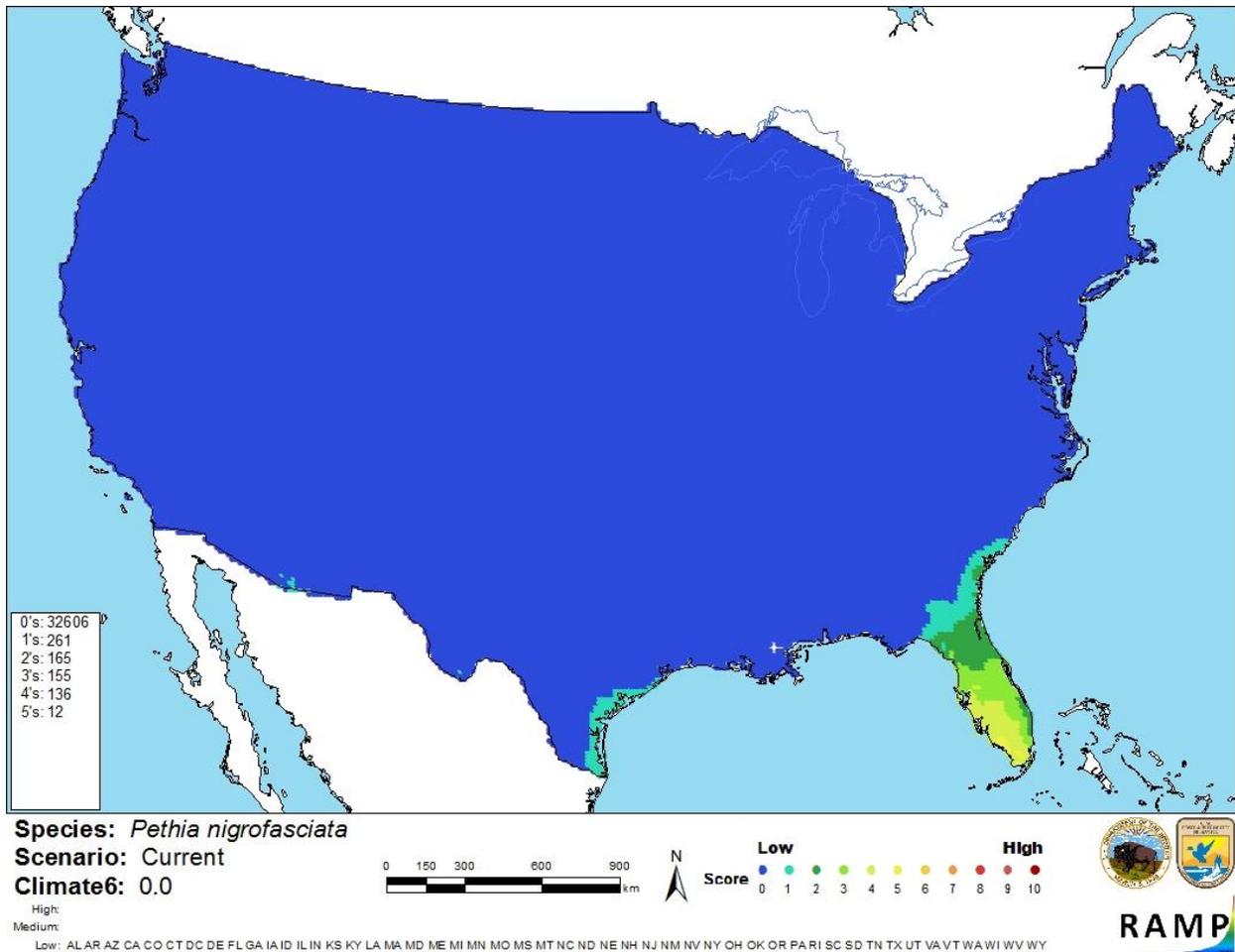


Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *Pethia nigrofasciata* in the contiguous United States based on source locations reported by Magalhães and Jacobi (2013) and GBIF Secretariat (2017). 0 = Lowest match, 10 = Highest match.

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

7 Certainty of Assessment

The certainty of assessment is medium. There was adequate ecological and biological information available. Some records of introduction were found. The record for an established, non-native population in Colombia did not have any location data available and was not able to be used as a source point in the climate match. There were no records of demonstrated ecological impacts from introductions of this species.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Pethia nigrofasciata is a freshwater fish native to Sri Lanka. It is also present in the aquarium industry. The history of invasiveness for *P. nigrofasciata* is not documented. There were records of introductions that resulted in established populations but no records of any demonstrated ecological impacts. The climate match is low. The results indicate that most of the country would not be able to support a population of *P. nigrofasciata* but there are small areas of Florida where the climate might be suitable. The certainty of assessment is medium. The overall risk assessment category is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): None Documented**
- **Climate Match (Sec. 6): Low**
- **Certainty of Assessment (Sec. 7): Medium**
- **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.

Butler, R. 2016. Black ruby barb, purple headed barb *Puntius nigrofasciatus*. Mongabay.com. San Francisco. Available: http://fish.mongabay.com/species/Puntius_nigrofasciatus.html. (April 2016).

Eschmeyer, W. N., R. Fricke, and R. van der Laan, editors. 2017. Catalog of fishes: genera, species, references. Available: <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmaintest.asp>. (April 2017).

FAO (Fisheries and Agriculture Organization of the United Nations). 2016. Database on introductions of aquatic species. FAO, Rome. Available: <http://www.fao.org/fishery/introsp/2272/en>. (April 2016).

Froese, R., and D. Pauly, editors. 2016. *Pethia nigrofasciata* (Günther, 1868) black ruby barb. FishBase. Available: <http://www.fishbase.se/summary/Pethia-nigrofasciata.html>. (April 2016).

GBIF Secretariat. 2017. GBIF backbone taxonomy: *Pethia nigrofasciata* (Günther, 1868). Global Biodiversity Information Facility, Copenhagen. Available: <http://www.gbif.org/species/7417764>. (April 2017).

ITIS (Integrated Taxonomic Information System). 2016. *Puntius nigrofasciatus* (Günther, 1868). Integrated Taxonomic Information System, Reston, Virginia. Available: http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=163645. (April 2016).

Sanders, S., C. Castiglione, and M. 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.

Axelrod, H. R., W. E. Burgess, N. Pronek, and J. G. Walls. 1991. Dr. Axelrod's atlas of freshwater aquarium fishes. Sixth edition. T.F.H. Publications, Neptune City, New Jersey.

Batuwita, S., K. Maduwage, and H. Sudasinghe. 2015. Redescription of *Pethia melanomaculata* (Teleostei: Cyprinidae) from Sri Lanka. *Zootaxa* 3936(4):575–583.

Bundesministerium für Ernährung, Landwirtschaft und Forsten (BMELF). 1999. Gutachten über Mindestanforderungen an die Haltung von Zierfischen (Süßwasser). Bundesministerium für Ernährung, Landwirtschaft und Forsten (BMELF), Bonn. (In German.)

De Silva, S. S., J. Schut, and K. Kortmulder. 1985. Reproductive biology of six *Barbus* species indigenous to Sri Lanka. *Environmental Biology of Fishes* 12:201–208.

Froese, R., and D. Pauly. 2007. FishBase. World Wide Web electronic publication. Available: <http://www.fishbase.org/>. (May 2007).

Günther, A. 1868. Catalogue of the fishes in the British Museum. Catalogue of the Physostomi, containing the families Heteropygii, Cyprinidae, Gonorhynchidae, Hyodontidae, Osteoglossidae, Clupeidae,... [thru]... Halosauridae, in the collection of the British Museum 7:1–512.

Katwate, K., F. Baby, R. Raghavan, and N. Dahanuka. 2014. The identity of *Pethia punctata*, a senior synonym of *P. muvattupuzhaensis* (Teleostei: Cyprinidae). *Zootaxa* 3884(3):201–221.

Katwate, U., C. Katwate, R. Raghavan, M. S. Paingankar, and N. Dahanukar. 2014. *Pethia lutea*, a new species of barb (Teleostei: Cyprinidae) and new records of *P. punctata* from northern Western Ghats of India. *Journal of Threatened Taxa* 6(6):5797–5818.

Kullander, S. O., and R. Britz. 2008. *Puntius padamyia*, a new species of cyprinid fish from Myanmar (Teleostei: Cyprinidae). *Electronic Journal of Ichthyology, Bulletin of the European Ichthyology Society* 2:56–66.

- Kullander, S. O., and F. Fang. 2005. Two new species of *Puntius* from northern Myanmar (Teleostei: Cyprinidae). *Copeia* 2005(2):290–302.
- Meegaskumbura, M., A. Silva, K. Maduwage, and R. Pethiyagoda. 2008. *Puntius reval*, a new barb from Sri Lanka (Teleostri: Cyprinidae). *Ichthyological Exploration of Freshwaters* 19(2):141–152.
- Menezes, N. A., S. H. Weitzman, O. T. Oyakawa, F. C. T. Lima, R. M. C. Castro, and M. J. Weitzman. 2007. Freshwater fishes of Mata Atlântica: list of species and comments on conservation of Neotropical freshwater fishes. Universidade de São Paulo, São Paulo, Brazil.
- Moyle, P. B., and F. R. Senanayake. 1984. Resource partitioning among the fishes of rainforest streams in Sri Lanka. *Journal of Zoology: Proceedings of the Zoological Society of London* 202:195–223.
- Pethiyagoda, R. 1991. Freshwater fishes of Sri Lanka. The Wildlife Heritage Trust of Sri Lanka, Colombo.
- Pethiyagoda, R., M. Meegaskumbura, and K. Maduwage. 2012. A synopsis of the South Asian fishes referred to *Puntius* (Pisces: Cyprinidae). *Ichthyological Exploration of Freshwaters* 23(1):69–95.
- Riehl, R., and H. A. Baensch. 1991. *Aquarien atlas*. Band. 1. Melle: Mergus, Verlag für Natur- und Heimtierkunde, Germany.
- Schut, J., S. S. De Silva, and K. Kortmulder. 1984. Habitat associations and competition of eight *Barbus* (= *Puntius*) species (Pisces, Cyprinidae) indigenous to Sri Lanka. *Netherlands Journal of Zoology* 34(2):159–181.
- Silva, A., K. Maduwage, and R. Pethiyagoda. 2008. *Puntius kamalika*, a new species of barb from Sri Lanka (Teleostei: Cyprinidae). *Zootaxa* 1824:55–64.
- Talwar, P. K., and A. G. Jhingran. 1991. *Inland fishes of India and adjacent countries*. Oxford & IBH Publishing, New Delhi, Bombay, Calcutta.